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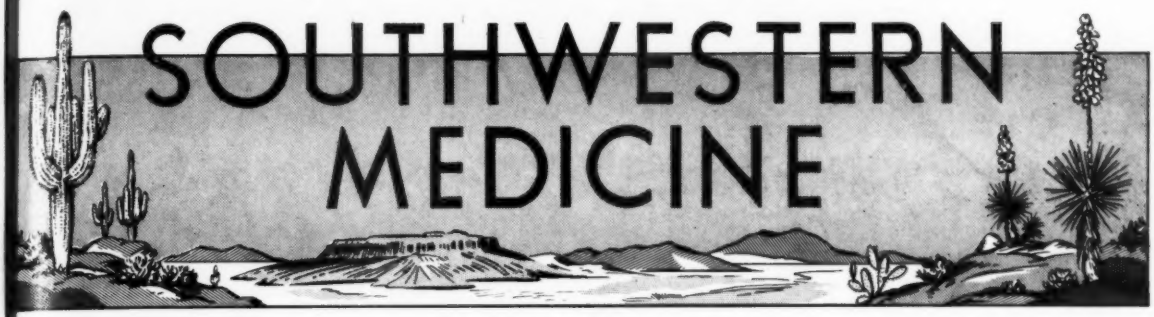

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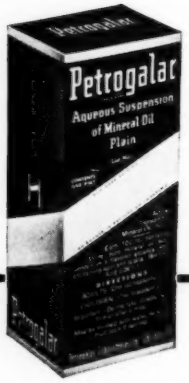

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SANTA FE SESSION

Elsewhere in this issue is printed the program of this war year meeting of the New Mexico Medical Society. So many of New Mexico's doctors are in service with the Army or Navy that it behooves those remaining at home to keep themselves professionally fit to carry the extra load imposed upon them. There is no better way to do this than attendance at one's state meetings. A splendid array of teachers will appear at this meeting. They deserve a large audience —it should be pleasurable to all to join them at beautiful Santa Fe.

Better make reservations early.

PEACE-TIME HERO -- A FABLE FOR 1942

Once upon a time, in the beautiful United States of America, there was a nice young doctor named Clancy. He had worked hard, being of a poor family, to become a specialist and acquire a fine home in an expensive section of the city. He met a lovely brown-eyed girl and, due to his hard-won prominence, her family allowed him to marry her. In the course of time, they had a beautiful child. Now everyone would exclaim "What a typical American family" and wag their heads with pleasure that a poor boy could do so well for himself in the greatest of all lands, the United States of America.

Doctor Clancy recognized his debt to his country, too—oh, yes, so he gave a little money each year to the girls from his wife's and mother-in-law's clubs to help them support their favorite charities. And, when, because of their good works, his women-folk's pictures were printed in the society pages of the newspapers so that all might be made aware of their great-hearted charities, the doctor rejoiced, and was proud in his heart to overflowing.

One night at a meeting of his medical society Clancy heard a disturbing thing. It seemed that the Army of his Country wanted young doctors for what they called reserve service, and that it was most honorable to offer one's talents and receive a diploma that conferred the title of lieutenant or captain on one. There would be some writing to do, and perhaps a two-weeks' paid vacation every year or so, where one would wear a pretty uniform, and in a very short time there would come another diploma that made one a major, or a colonel. The silver bars that a captain wore on his shoulders were very shiny, but gosh, those oak leaves and tough looking eagles that majors and colonels could sport were so much more grand. Of course, before one could get a diploma making him a lieutenant or a captain, he must go to a strange place in the post office building and be examined and show those men there in brown uniforms that there was nothing wrong with him like bad feet or weak eyes or jumpy heart. But Doctor Clancy had always been of good health. He had lived a frugal life in his boyhood, because his Daddy could not buy him rich foods and sacks of candy. It was only lately that he had found exciting the bubbles in the wine glass and intriguing the saltiness of little black fish eggs—only since he had prospered in the land of the United States that had protected him, educated him, and made his little family safe in the night. So there wasn't anything wrong with him—there hadn't been time for anything to go wrong yet—and he got his diploma and framed it and hung it in his office for all to see.

As Doctor Clancy said later, that annual two-weeks paid vacation on what was called active duty was "pretty soft." What great fun it was to put on that trim garb with the silver bars on the shoulders and the shiny leather belt around

the waist, and parade before the mirrors in his lovely new house in an "exclusive" part of the city.

How his baby clapped its hands and crowed with pleasure, and how his pretty wife's eyes shone with pride at the figure her hero made, so straight and so male-like as a defender of his Country, the Great United States of America. How excited were the girls in the club over the "tree-e-e-mendjus" sacrifice Hero Clancy was making. Truly, the greatest of all countries was safe and secure, with heroes behind every bush to repel the barbarian enemy.

Then, one bright morning, the radio told of the gathering of clouds over a land called Europe. The huge armies there were taking up their fighting where they left off nearly a quarter-century before. Folks began to say to Hero Clancy, "I suppose you'll be called to duty any day now," and smile in the secure knowledge that fellows like Clancy were what made their United States great and free and strong. How Hero Clancy would swell with patriotism and pride when he saw that his people depended on him and had faith in him their defender. How excited were the girls in his wife's club over the silently splendid way his wife was taking the whole affair—so noble in her gift to the land they loved so well. True enough, Hero Clancy had not actually been called to duty yet, but then he might—a shiveringly thrilling prospect.

One day a letter came. It seemed that Hero Clancy had not written enough in his correspondence courses. And unless he did a lot of writing he might be deprived of his diploma, and that space on his office wall be made bare. Thinking that over, he bought a noon paper and saw a story:

"Washington, D. C.—The Army announced today that it expects to call Reserve Officers to active duty shortly."

Late that afternoon, deciding that he no longer cared to write his Correspondence lessons, and that a gold oak leaf on the shoulder wasn't everything, after all, he sent in a resignation from his status of defender of his country. No, he wasn't afraid of being called, you understand. It was just that lately, since the war began, his poor feet had been hurting, and he had indigestion, and he had thought some of seeing if he needed glasses. You might even say that he wasn't afraid—it was just that he had a big new house he couldn't pay for on a captain's salary.

Now, sure enough, in a very short time other doctors were one by one leaving Hero Clancy's city—going to the Army and the Navy of their Country. And Doctor Clancy thought they were saps, and said so. It came to pass that the United States was attacked one foul morning and hosts of men arose and joined the armed forces to repel the enemy. But not Doctor Clancy. His hero days were over. And when well meaning folks asked our friend when he was going to jump in the old uniform and lend his aid, he straight-faced answered "The Army discharged me; they couldn't use me, I guess." So he stayed home, in that very house made secure and safe by the efforts and fighting of his fellow-citizens.

And he bought a Defense Bond, and felt good, because he had done his bit. Other men, not half so able physically as he, went to the stormy Atlantic or cold Iceland, or joined MacArthur's immortals, or worked in training stations and hospitals on the mainland. These other chaps did not think much of being heroes—they were simply too busy.

And this then is the story of Doctor Clancy—a peacetime hero.

Do you have a Doctor Clancy in your home town?

Recent Advances in Thoracic Surgery

JAMES M. OVENS, M. D.
Phoenix, Arizona

THORACIC surgery in itself may be stated to be a recent advance in surgery. Its beginning as well as the beginning of accurate diagnosis of all intra-thoracic disease was in 1895. On November 8th at the Institute of Physics at the University of Wurzburg in Bavaria[1], Prof. Wilhelm Konrad Roentgen first demonstrated his rays originating from a Crooke's tube stimulated by sparks from an induction coil. Thus, with the discovery of X-rays, and the climaxing of this great physicist's series of experiments with Cathode rays, was born this accurate

Read before the Southwest Indian Service Medical and Nurses Societies, Phoenix, Arizona, November 12, 1941.

method of diagnosis so vitally necessary for intelligent comprehension and treatment of subcostal conditions. Progress was slow at the turn of the century, however, and it was not until the more recent knowledge of the basic sciences that the pace in advancing thoracic surgery was quickened. During the last decade great strides have been taken and it is with these newer advancements that this summary deals.

DIAGNOSIS

Fundamental in importance are the more recent advances in the diagnosis of intra-thoracic conditions. Bronchoscopy is an ever improving and necessary method of diagnosis of intra-tracheal and intra-bronchial conditions, for it is only with this method that conditions of these structures can be directly seen and biopsys taken. Thoracascopy, after diagnostic pneumothorax and Roentgenograms is being used more and more for visualization of intra-pleural pathological conditions, or for visualization of secondary conditions in this area, due to pathology elsewhere. Bronchography, by any of the techniques desired, is absolutely necessary for differential diagnosis of many lesions of the lungs. Radiographs, in correct positions, six foot stereographs, light and heavy exposures, and the most recent development, laminographs or tomographs[2] are of the utmost importance in localization of lesions such as abscesses, especially where the pulmonary fields are obscured by some other factor, such as an effusion, etc. Roentgen Kymography may be an aid in diagnosis of aneurysms and allied conditions. Punch biopsy is a new procedure in thoracic surgery, having previously been used for prostatic and liver biopsy. Its diagnostic value of aiding in the discovery of the fundamental pathological condition present.

Infra-red photography, though being of no singular importance, may be the final link in the chain of diagnostic procedures necessary for the diagnosis of sub-sternal goiter or other conditions blocking the thoracic inlet. Arteriograms, in diagnosis of vascular conditions of abnormality is now of importance with the use of accurately timed radiographs and fluoroscopy. Pneumoperitoneum is now a necessity in the solving of many diaphragmatic puzzles. The examination of the sputum for malignant cells has been used for diagnosis and is a valuable aid in a small percent of cases. X-ray therapy is a valuable aid in differentiating Hodgkin's disease and sarcomata of the mediastinum which are radiosensitive for a time, from the carcinomata which are unaffected by the Roentgen rays.

BASIC SCIENCES

PHYSIOLOGY. Among the basic sciences the recent advances in pulmonary physiology, the more exact studies of the respiratory exchanges of the air, vital capacity, and intrapleural pressures have been very important. The better understanding of mediastinal flutter, fixed mediastinum and paradoxical respiration, has led the path for better anesthesia and treatment.

PATHOLOGY. The progress in the pathological conditions involving the lungs has progressed markedly. The description of the superior pulmonary sulcus tumor by Pencost in 1932[3] and Stein's description in 1938[4] of the apical lung tumor are new milestones. The description of the mixed tumors of the lungs by Womack and Graham[5] has been a new contribution to the field.

Of late the understanding of the successive changes of emphysema-atelectons-suppuration occurring distal to the bronchial neoplasm has been widely publicized[6] and has become a fundamental pathological process well understood by all interested in thoracic pathology.

ANESTHESIA

Although cyclopropane was first prepared by August von Freund in 1882[7], it was not until 1930 that Waters, Neff and Rovenstein administered it clinically at the University of Wisconsin. It is the most inflammable and explosive of all the gasses used in anesthesia, but despite this, it is the most desirable general anesthesia in thoracic surgery and is now used much more than any other inhalation[8] anesthetic. With it a thoracic operation is no longer a race against anoxia. When the cautery or coagulator are being used other means are employed.

Colonic anesthesia with calculated doses of tribromethanol is an excellent basal anesthetic, and intra-venous anesthetics such as evipal and pentothal sodium are being used more and more daily, particularly where the cautery or coagulator is to be used. Both are better when used as basal anesthetics with procain infiltration or nerve block than when used alone.

Spinal anesthesia for thoracic work is advancing, especially now that anesthesia is a specialized branch of medical practice and more

time is being devoted to accurate spinal blocks.

Whether inhalation, rectal or intra-venous anesthesia is used the problem of maintaining an open airway is of utmost importance. Whether it be with endotracheal intubation, with or without a balloon, or without intubation, the value of suction in wet cases must be kept in mind.

Positive pressure anesthesia, especially in intra-pleural[8] operations is a valuable aid, but not so necessary with local or spinal anesthesia as with inhalation anesthetics.

CONGENITAL LESIONS

Among the congenital intra-thoracic lesions that have recently been successfully treated surgically and for which the only care is surgery are the congenital stenosis of the larynx, trachea and bronchii. These lesions are treated with the bronchoscope. Recently Gross[16] has reported a successful case of ligation of a patent ductus arteriosis in a girl 7½ years old with apparently a complete cure of the altered circulation.

LUNG ABSCESS

Lung abscesses, particularly the more virulent, putrid type still remain a surgical nemesis. Regardless of the alleged efficacy of Guiacol and other products in the treatment of these conditions, the great curative measure remains as surgery. Regardless of whether it originates embolically or by aspiration, the treatment is the same. Early abscesses, especially the central ones, are often cured by repeated bronchoscopic drainage, while after a wall has been formed open drainage with the knife or cautery after thoracotomy is the method of choice. One must be sure the pleural layers are adherent, however. I have lately used the Monaldi continuous negative pressure method with success in suppurative non-tubercular abscess of the lung.

BRONCHIECTASIS

In bronchiectatic lesions of the lungs we now have a condition that is as surgical a disease as is acute appendicitis. No longer need the bronchiectatic patient spend a lifetime of postural drainage, foul breath and continuous oral, intra-venous and inhalation medication. At present the curative treatment for bronchiectasis is lobectomy, lobectomys or pneumonectomy, and the general practitioner or internist should feel it his duty to see that his patient with this condition has worthy surgical consultation before any other form of treatment is considered[10]. Naturally the areas affected should be mapped out by bronchography and the plan of surgical attack then considered. Medical methods have been tried for years—have failed for years and there is now a surgical cure for a great percentage of people with this dreaded disease.

EMPYEMA

ACUTE. The trend in acute non-tubercular empyema is now toward rib resection and drainage by means of a closed system, rather than with the open method or the Mazingo manner. At the optimum time the minor thoracotomy is performed and the airtight water seal drainage is instituted with the pulmonary fields being re-expanded by bottle blowing exercises. Should this method fail to re-expand the lung, negative pleural pressure is then instituted by means of suction applied to the airtight system. Pneumothorax, and too early drainage should be avoided[11]. In infants under two years of age, continuous aspiration is the method of choice rather than rib resection. The presence of bronchopleural fistula alters the course of treatment, but slightly. In these patients the institution of negative intra-pleural pressure is unnecessary, for in time the pleural space tends to obliterate itself.

CHRONIC. In chronic empyema the cavity is to be closed by any means. Lacework or cruciate incisions of the thickened visceral pleura followed by blowing exercises may suffice in some cases. In contrast to this method, which brings the lung to the chest wall is the Schede operation which obliterates the cavity by bringing the de-ribbed chest wall to the pleura.

Also being used extensively in obliterating chronic empyema cavities is the partial selective thorocoplasty[12] with pedicle muscle grafting, the pectoralis major, latissimus dorsi, and the trapezius being used. This method produces practically no deformity.

TUBERCULOSIS

In the treatment of pulmonary tuberculosis the most recent and fruitful advances in surgical phthisiology are:

1. The Monaldi procedure
2. The extrapleural pneumothorax
3. More selective thoracoplasty
4. Lobectomy or pneumonectomy

1. The Monaldi continuous suction has proven itself to be of value in the collapse of cavities, particularly those with a positive intra-cavity

pressure. The procedure can be used on suppurative lesions as lung abscesses also, especially when situated near the lung periphery and with an adherent pleura. Soft walled, poorly draining cavities are most responsive.

The cavity is first accurately localized with whatever films are deemed necessary. It is then entered with a tracer and aspirated. The rubber catheter is inserted after removal of the obturator. The catheter is maintained in position by means of black silk, safety pins or adhesive. The catheter position is then checked with the X-ray and if in the proper position the negative pressure instituted until the cavity is obliterated or markedly reduced in size. Reduction in size of cavities may be noted in from a few days to several weeks.

2. Extra-pleural pneumothorax is being used more and more daily and many believe it should be performed wherever intra-pleural pneumothorax is tried and fails. The operation is not difficult. The extra-pleural space is approached via the anterior or the posterior route. I prefer the posterior route through the 4th rib bed. The line of elevage between the endothoracic fascia and the visceral pleura is easily found and the apex collapsed[13]. The manual dissection is then carried down as far as is deemed necessary. The space is filled with saline after hematosis is secured and the wound then closed in airtight fashion. In twenty-four to thirty-six hours saline aspiration and air introduction is begun. Positive pressure is maintained at approximately twenty-five centimeters water pressure to prevent the lung from re-expanding. The collapse is maintained as long as the pathology requires.

3. The old Sauerbruch thoracoplasty is now antiquated. Instead of removing small segments of many ribs, now localized areas are being entirely removed of their bony framework by the extra-pleural technique in one or more stages. The pleural cavity is never entered and the mortality rate is very low.

4. Lung resections for tuberculosis were carried out as early as 1881[12]. With the development of other methods of collapse therapy resection was then dropped. Lately pneumonectomy and lobectomy are being used for other conditions and have also returned again to the armamentarium of the phthisologist. Resections have been carried out for large areas of caseation and liquefaction, particularly with a lesion such as stenosis, causing the draining bronchus to be occluded. It has also been recommended for large cavities that cannot be collapsed by chest wall surgery.

Pneumoperitoneum is being used by many very good men while others doubt its efficacy. None, however, can deny that a marked collapse of pulmonary tissue takes place with this method as is indicated by the reduction in vital capacity.

Phrenic operations of all sorts as well as operations on the scalenii muscles are not being used as much as formerly.

COSMETIC RESULTS

The treatment of inflammatory conditions of the thorax necessitating rib resections of varying degrees and residual pleural adhesions and thickening formerly resolved itself to saving the patients life. Now it is the duty of the thoracic surgeon to not merely save life, but to leave the patient with as little functional and cosmetic handicap as possible. After any operation on the ribs, pleura or lungs, the patient should be placed in such a position that the natural deformity which tends to result is compensated for by wedges, fromes, casts, or whatever mechanical means best suited, placed correctly, to prevent the occurrence of the anticipated deformity. Bisgard[14] has differentiated the pleurogenic and the thoracoplastogenic deformities excellently and has written on their pathogenesis and treatment in commendable fashion.

NEOPLASMS

Pulmonary neoplasms are now joining the large family of successfully treated intra-thoracic conditions. Benign lesions of the bronchial tree are successfully removed with the bronchoscope.

Lobectomy has been superceded by the present pneumonectomy for malignant lesions of the bronchii and lung periphery. Metastasis takes place early and only a small percentage of these lesions are in the operable stage when the diagnosis is reached. Only between 10% and 25% of these cases are classified as operable and can be given the benefit of surgery. Although pneumonectomy is the classical operation for malignancy of the lung, a small percentage of localized tumors with no spread are suitable for lobectomy.

THORACOSCOPY

Thoracoscopy has shared in the recent advances of this new field of surgery. Thoraco-

scopic diagnosis and treatment are both improving and among the adhesions that are now being severed are the large vascular adhesions which are clamped via the thorascope and tied before their severance. This is still in the experimental stage, however.

HEART

Nor has the surgery of the heart been lagging in this progressive field. Suturing of cardiac wounds has improved. Pericardiolysis is still being performed and in a method that has improved with time. Pericardial tamponade and the points of diagnosis in this condition are all better understood.

Recently Beck [19] has reported his operation for increasing the blood supply to the heart muscle in patients with coronary artery sclerosis and angina pectoris. He makes a transverse incision on the left side. The pectoralis major is divided laterally. The 5th and 6th costal cartilages are excised, the pectoralis major is then split in the axis of its fibers and the upper flaps brought to the anterior surface of the heart, after the pericardium and epicardium are removed. The inferior flap he wraps around the heart to the posterior surface. The pericardium is left open and the soft tissues closed.

O'Shaughnessey[20] has developed another method in which he brings the omentum up through the diaphragm and pericardium to the heart. Beck states he, too, has used this method experimentally[19].

Mautz[21] has done much work on the reduction of the cardiac irritability by the application of drugs topographically. He has also found quinidine sulphate valuable when given per os. These drugs correctly used are valuable in preventing such conditions as auricular or ventricular fibrillation, tachycardia, etc., from arising when one is already busily engaged in some form of surgery on the heart, which is difficult enough, without these added complications.

AUTONOMIC NERVOUS SYSTEM

Not only are the lungs and thoracic cage taking place in the progressive march, but the surgery of the heart and the intra-thoracic autonomic nervous system is taking large steps forward.

No longer need the cardiac patient suffer the agonizing pangs of "angina pectoris" for with the present knowledge of the cardiac innervation the patient with anginal pains has merely not seen a progressive surgeon or internist. For the patients who are poor surgical risks the sympathetic ganglia from the first to the 4th or 5th thoracic are now injected alcohol on one or both sides, as is determined by the severity and radiation of the pain. This relieves the anginal pain, but the patient is still gripped with a tight pre-cordial squeezing sensation that serves as the buffered warning of over exertion in place of the anginal pain. This relief of pain lasts for one to six months.

For the patient who is a better surgical risk a more perfect and permanent cure of pain is offered in the resection of the stellate and upper four thoracic ganglia, or posterior rhizotomy of the first to the 4th or 5th spinal nerves. These methods are much more satisfactory, more permanent with less chance of post operative pleural pain or neuritis.

Technical difficulties may frequently be met in the alcoholic injections.

The patient with peripheral vascular disease of the spastic type can now be greatly aided by the thoracic surgeon, for after primary injection of the ganglia with procain solution to test the results to be obtained, the cervico-dorsal ganglionectomy involving the stellate and upper 4th ganglia can be performed to furnish the upper extremities with much relief. Of course the lumbar sympathectomy must be performed for lower extremity relief.

The use of the thoracic splanchnicectomy in hypertensive therapy is not new. However, recently more widespread operative procedures have been advocated such as the removal through a double posterior approach of the stellate and all thoracic ganglia as well as both aplancnics and the celiac ganglion and, if possible, the first or second lumbar ganglion. This is followed by the lumbar incision for removal of the remaining lumbar ganglia.

CONCLUSION

In this short and sketchy summary we see that practically every intra-thoracic disease is in some form best treated by surgery. The field of thoracic surgery is ever broadening and just as bronchiectasis was yesterday a medical and is today a surgical disease, so today's medical diseases may be tomorrow's surgical diseases and it is the duty of the general practitioner and the internist, as well as the surgeon, to keep moving forward with this rapidly pro-

gressing field in order that he may not miss a single opportunity to aid the patient that may be bearing one of these diseases.

Lois Grunow Memorial Clinic.

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Pathological Physiology of the Liver

(I. Regulation of the Blood)

J. P. SIMONDS, M. D.
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THE liver is the largest, the most versatile and the most hermit-like organ in the body. It has a very large factor of safety, or functional reserve. It is possible to remove three-fourths of the liver of an experimental animal without serious results to the animal as a whole. This is an important fact in the evaluation of the results of tests of liver function for clinical purposes.

After partial removal of the liver and after selective destruction of hepatic cells, leaving a framework of the stroma intact, the power of regeneration of the liver is so great it will regenerate about 90 per cent of the lost liver tissue within a few weeks. Thus, not only may the liver maintain its normal functional capacity in spite of extensive damage to its substance, but it will rapidly regain much of its original functional reserve. Evidence of the extent of injury or destruction of liver tissue that may occur without detectable reduction of hepatic function, as measured by the usual functional tests, is frequently seen at autopsies when the liver is reduced to less than one-half its normal size and, on microscopic examination is found to have lost a much larger proportion of its parenchyma. Furthermore, evidence of the powers of regeneration is often observed in patients who have died years after recovery from such diseases as acute yellow atrophy in which massive destruction of liver tissue is known to occur. In the process of regeneration the original structural pattern of the liver may be completely restored as after poisoning with chloroform. In this condition the hepatic cells are selectively destroyed leaving the framework of the stroma intact to guide the process of regeneration. On the other hand, in cirrhosis of the liver and in the healing of acute yellow atrophy, regeneration does not result in restoration of the original structural pattern. The newly regenerated liver cells are not arranged as cords radiating outward from a central vein, but as irregular cords and sinusoids separated into irregular masses by bands of connective tissue. This results in a disturbance of the circulation through the liver, in the production of a condition that has some of the characteristics of an Eck fistula in an experimental animal in which the portal vein has been anastomosed with the inferior vena cava. Eck fistula dogs can be actually poisoned by a high

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protein diet; and patients with cirrhosis of the liver do not do well on a diet rich in proteins.

CIRCULATION OF LIVER

The amount of blood which passes through the liver is enormous. It is greater than in any other organ except the lungs. The thyroid gland is said to have the richest blood supply of any organ in the body, since it receives 560 cc. of blood per 100 grams of gland substance per minute. The blood flow through the kidneys is about 200 cc. and through the liver about 150 cc. per 100 grams of tissue per minute. But when the size and weight of these organs are taken into consideration, the difference becomes marked. Thus the thyroid, which normally weighs about 40 grams, receives 224 cc. of blood per minute; the kidneys, weighing 300 grams, receive 600 cc. of blood per minute; while the normal liver, which weighs about 1500 grams, receives 2.25 liters of blood per minute or 37.5 per cent of all the blood in the body. The two lungs receive from 3 to 4.6 liters of blood per minute. The fact that such an enormous quantity of blood passes through the liver each minute is an indication of the great importance of this organ in the economy of the body. The circulation through the liver is rapid in spite of the fact that the pressure in the portal vein—the *vis a tergo* behind three-fourths of the blood traversing the liver—is low, being 8 to 12 mm. Hg in the dog and probably about the same in man.

The structural pattern of the circulation through the liver is an important factor in its functional activity. The liver, kidneys and lungs are concerned with producing alterations in the composition of the blood and each has a peculiar type of circulation and arrangement of its parenchyma adapted to accomplishing this end. The circulation in these organs differs quite markedly from that in other organs, such as the heart and brain, for example, in which the blood supply is only for the purpose of nourishment and removal of waste products. The cells of the liver are arranged in narrow cords which radiate outward from the central veins. This arrangement had some resemblance to that of the fascicular zone of the adrenal glands which are purely endocrine organs. Between the cords of liver cells is a rich network of wide sinusoidal capillaries. In this way each hepatic cell has two or more of its sides, or facets, 50 per cent or more of its surface, separated from a stream of blood by only a thin wall of endothelium and an exceedingly narrow tissue space. In this many-sided contact of hepatic cells with capillaries also the liver resembles a gland of internal secretion. The bile, which is the only external secretion of the liver, is discharged into very minute bile capillaries which lie between the hepatic cells, instead of into the lumen of a tubular or acinar gland. This intimate relation of the cells of the liver to capillaries facilitates the extraction from the blood of amino acids for deamination, sugar for storage as glycogen and toxic substances for detoxification; and their discharge into the blood of urea, glucose and other substances which the liver contributes to the blood for transportation to other cells of the body for their use or to other organs for excretion.

Not only is the quantity of blood passing through the liver important, its quality is also significant. About one-fourth of its blood supply reaches the liver by way of the hepatic artery; it is, therefore, arterial blood and is distributed mainly to the fibrous tissue of the capsule and the interlubular septa. Two-thirds to three-fourths of its blood is received through the portal vein after having passed through the capillaries of the stomach and intestines, and is therefore venous blood. Arterial blood is normally from 95 to 98 per cent saturated with oxygen; venous blood is about 70 per cent saturated. The mixed blood in the sinusoids of the liver is not more than 76.7 per cent saturated with oxygen. The blood circulating through this organ therefore contains less oxygen than does that of any other organ of the body. And yet, in spite of this continuous anoxia, the liver carries on its numerous functions effectively. It is adapted to a low oxygen tension and can perhaps work best under this condition. Just how this deficiency of oxygen and high content of carbon dioxide facilitates the various chemical processes that take place in the liver is not known. This particular questions does not appear to have been extensively studied and little that is definite can be said about it. However, two mechanisms for the formation of urea have been described in the liver, both of which require the presence of carbon dioxide as carbonic acid. One mechanism consists of the direct combination of the ammonia produced by the deamination of amino acids with carbonic acid to form ammonium carbonate. This substance

is then hydrolysed to ammonium carbamate and this to urea. By the other mechanism, either arginine is hydrolyzed directly into ornithine and urea by arginase, or ornithine combines with ammonia and carbonic acid to form arginine which is then split by the enzyme into ornithine and urea. Thus ornithine and arginine may act as intermediary substances in the formation of urea from ammonia liberated from the amino acids. Both mechanisms require carbonic acid. This is, therefore, an example of the manner in which low oxygen tension and high carbon dioxide content of the blood in the liver may be essential to its functional activity.

LIVER FUNCTIONS

The liver has a dozen or more separate and distinct functions. But in spite of its size and its busy activity, it is a most silent and dignified organ. When the heart is called upon to do more work it makes its complaints known by heavy and rapid pounding that may cause much distress. When a demand for more oxygen is made upon the lungs, as during vigorous exercise or because of disease of the heart, they comply but with groans and heaving respiration. The intestines and the kidneys make us acutely conscious of their functional activity. Even the brain produces a thought or calls up a memory once in a while. But the liver, with its great size and its numerous and varied activities, performs its duties with quiet dignity and patient industry. Even when insulted by serious injury it rarely retaliates by acute pain. The dull, indefinite pain which may accompany passive congestion or even abscess of the liver is probably due to the stretching of the capsule or to traction on its diaphragmatic attachments.

The functions of the liver may be grouped into those which are concerned in the regulation of the composition and volume of the blood, and those concerned with general metabolism.

During early embryonic life the liver is one of the chief sources of supply of blood cells. It surrenders this function only when the bone marrow has developed sufficiently to take over this essential activity. This usually occurs in the later months of fetal life. But hematopoiesis in the liver is often still active at birth and the sinusoids are crowded with immature blood cells. But the duties of the liver pertaining to the blood do not end with cessation of its function of hematopoiesis, because during the entire life of the individual it is one of the official cleansers of the circulating blood. Red blood cells are relatively short-lived. As senile erythrocytes totter through the sinusoids of the liver they are quietly removed from the blood stream by the Kupffer cells to be disposed of by a sort of authanasia. While the liver is not the only organ that performs the last rites for aged and dying erythrocytes, and its parenchyma is not at all concerned with this process, it is an important factor in this function. Furthermore, no matter where the red cells are caught and destroyed by the littoral cells of the widely distributed reticuloendothelial system, a very considerable part, if not all, of the products of that destruction ultimately reach the liver for further disposal.

Of the products of disintegration of hemoglobin, liberated by the destruction of red blood cells, the liver stores for further use of the iron-containing hemosiderin, but excretes most of the iron-free bilirubin (hematoidin) as a waste product. The normal liver always contains a moderate amount of hemosiderin which is the scrap-iron of the body, useful in building new hemoglobin. The greater part of the iron absorbed from the intestines is stored in the liver. The quantity present is increased in pernicious anemia and in other types of anemia accompanied by increased destruction of red cells, such as that which is responsible for hemolytic jaundice. Even under conditions of very severe anemia the amount of this iron-containing pigment in the liver is never sufficiently great to interfere seriously with its function. On the other hand, in hemochromatosis, a disease due to a disturbance of iron metabolism, the amount of hemosiderin stored in the liver, spleen, pancreas, skin and other organs, reaches enormous proportions. This disease is not accompanied by anemia and the accumulation of hemosiderin is not the result of destruction of arythrocytes, but to a disturbance of the metabolism of iron. The amount of hemosiderin in the liver in this condition may exceed that which could be produced by the destruction of all the red cells in the body, that is, it exceeds the amount of hemosiderin that could be yielded by the entire mass of hemoglobin in the body. The huge amount of hemosiderin in the liver and pancreas acts as an irritant and causes cirrhosis of the liver with consequent disturb-

ance of hepatic function; it causes fibrosis of the islets of Langerhans in the pancreas and leads to diabetes. Since the pigment is also deposited in the skin giving it a brown color, when accompanied by hyperglycemia and glysosuria this is called bronzed diabetes. It may be remarked in passing that H. R. Fishback, working in our laboratory has devised a very simple test for the diagnosis of hemochromatosis. It consists of the intradermal injection of about 1 cubic millimeter of a very dilute solution of potassium ferrocyanide and hydrochloric acid. The hemosiderin deposited in the skin gives a Prussian Blue reaction with this reagent with the formation of a blue-black spot at the site of the injection.

Although the greater part of the bilirubin is excreted as waste, a small portion of it is retained in the body and used in building the molecule of hemoglobin. Heme, the essential pigment fraction of the hemoglobin molecule, and bilirubin are very closely related chemically. It is possible, also, that the liver combines certain amino acids and perhaps other chemical substances which are necessary for the building of hemoglobin by the bone marrow. In other words, the liver plays a role in the manufacture of hemoglobin for red blood cells. Furthermore, the liver stores the anti-anemic factor formed in the stomach and thus maintains a constant supply of this substance which is required for the maturation of red blood cells. Pernicious anemia, which results from lack of this anti-anemic factor, is not due to any disturbance of hepatic function but rather to the inability of the liver to obtain and store for constant use, an adequate amount of this essential substance. Cirrhotic livers have been found to be deficient in the anti-anemic factor (Wintrobe). Many patients with cirrhosis and other chronic diseases of the liver have a macrocytic anemia, which, though less severe, is like pernicious anemia in that it shows spontaneous remissions and is improved by liver therapy. Pyridoxin (vitamin B_6), which contains a pyridine ring and is either manufactured by or stored in the liver, increases the regeneration of hemoglobin and of red blood cells in anemia.

Thus the liver contains a portion of the reticuloendothelial system which is responsible for the destruction of wornout erythrocytes. By storing iron-containing pigment (hemosiderin), the anti-anemic factor and pyridoxin (vitamin B_6) and, possibly, by synthesizing certain amino acids essential for the formation of hemoglobin, plays an essential role in the regeneration of new red blood cells and in the prevention of anemia.

Bilirubin is not manufactured by the liver, and is liberated from hemoglobin by the reticuloendothelial system. The liver is merely its portal of exit from the body. When, for any reason, the liver is unable to excrete this waste product, it accumulates in the blood and, if it reaches a sufficiently high concentration, jaundice occurs.

Although bilirubin is carried in the bile to the intestine it is not normally present as such in the feces. It is reduced by bacteria in the colon to stercobilin which is similar to, if not identical with, urobilin. A portion of this reduced substance, urobilinogen, is absorbed from the colon and carried in the blood of the portal vein to the liver where most of it is re-excreted in the bile. Only a small portion normally passes through the liver to the general circulation to be filtered out by the kidneys. Extensive injury to the liver reduces its power to re-excrete this substance and leaves a larger quantity to enter the general circulation. An excess of urobilinogen in the urine is, therefore, a sensitive indicator of extensive damage to the liver.

The significance of this fact, as well as of certain others described in this paper, will be made clearer by a brief consideration of the relation of urobilinogen to the functions of the kidney and of the liver, respectively. Urobilinogen, like urea and sodium chloride, is excreted by the kidney by filtration through the glomeruli. This filtration is a purely passive process so far as the kidneys are concerned. It requires no work on their part, the energy for the process being furnished by the heart in maintaining systematic blood pressure and, through this, the filtration pressure in the glomeruli. On the other hand, urobilinogen is removed from the blood by the liver by the active process of excretion, a process which requires the expenditure of energy. A damaged kidney can still remove substances like urobilinogen from the blood as long as the glomeruli receive an adequate amount of blood under sufficient pressure. An extensively damaged liver,

on the other hand, is unable to excrete urobilinogen and similar substances because it is unable either to produce or to utilize the necessary amount of energy to accomplish this process. This is the basis of the determination of the quantity of urobilinogen in the urine as a test of hepatic function.

ROLE OF LIVER IN BLOOD COAGULATION

Of the five factors which are concerned in the coagulation of the blood, three—fibrinogen, heparin or antithrombin and prothrombin—are believed to be produced wholly or in part by the liver.

Heparin is either a phospholipid (kephalin) or, according to Best and Taylor, a carbohydrate substance, probably a compound of glycuronic acid. It prevents the combination of calcium and prothrombin to form thrombin. The liver contains a larger quantity of heparin than any other organ, but it is present in considerable amount in the muscles and lungs and in small quantities in the spleen, heart and thymus. The amount present in the plasma is exceedingly small, but is adequate to prevent intravascular clotting. One milligram of the most potent sample of heparin yet produced—that of Scott and Charles from beef liver—will prevent coagulation of 500 cc. of blood for 24 hours. Since the liver is so rich in this substance it is generally believed that it is produced solely or chiefly in this organ. But the effects of damage to the liver on the production of heparin are not known. Pathologic conditions that might affect the production of heparin would simultaneously affect other factors concerned in the coagulation of the blood. There is no method now known that will differentiate between affects on these different factors.

Prothrombin is apparently produced only by the liver and is related to vitamin K. The production of prothrombin is reduced to diseases of the liver, particularly in obstructive jaundice in which the absence of bile from the intestines prevents the absorption of vitamin K. Whether this vitamin is prothrombin, or whether it is the substance from which prothrombin is made, or whether its presence is merely necessary for the formation of prothrombin is not definitely known. But unless vitamin K is present in the liver in sufficient amount, prothrombin is not formed in adequate quantity and coagulation of the blood does not take place in the normal manner. However, hemorrhage does not usually occur until the prothrombin of the blood is reduced to about 20 per cent of the normal amount.

Hemorrhages due to hypoprothrombinemia resulting from deficiency of vitamin K, respond readily to administration of this vitamin. They are found in various conditions. (1) Prolonged use of a diet, usually low in fats, which is deficient in vitamin K may give rise to a hemorrhagic state. This condition is rare in human beings. (2) Hemorrhages in the newborn are frequently due to this cause and can be prevented by administration of the vitamin to the mother for a few days prior to delivery. (3) Diseases which interfere with intestinal absorption, such as diarrhea, chronic ulcerative colitis and sprue, may cause vitamin K deficiency, hypothrombinemia and hemorrhage. Oral administration of the natural vitamin is ineffective in such cases, but parenteral injection of the synthetic vitamin yields gratifying results. (4) Extensive damage to the liver, such as occurs in poisoning with phosphorus and chloroform and in acute yellow atrophy, result in hypoprothrombinemia even in the presence of an adequate supply of vitamin K. The damaged liver cells are unable to produce prothrombin. (5) The presence of bile salts in the intestine is essential to the absorption of vitamin K. Obstruction of the common bile duct, long continued bile fistula and the inability of the liver to manufacture bile salts induce vitamin K deficiency, hypoprothrombinemia and frequently serious hemorrhages. When vitamin K is administered to patients with obstructive jaundice, together with sufficient bile salts to insure its absorption from the intestine, prothrombin usually increases rapidly and the coagulation of the blood becomes normal and the danger of hemorrhage is removed. However, the administration of bile salts and vitamin K to jaundiced patients fails to produce these results when the jaundice is accompanied by serious damage to the liver itself. The damaged liver cells are unable, even in the presence of an adequate supply of the vitamin, to produce prothrombin. This method of treatment may, therefore, have either therapeutic or diagnostic value. When ineffective it indicates damage to the liver.

Fibrinogen is one of the plasma proteins. In

its natural state it is in solution in the plasma. In the process of clotting of blood it is precipitated by the action of thrombin in the form of a fine meshwork of filaments in which the red blood cells and other formed elements of the blood are entangled. In diseases which involve destruction of liver cells, as in poisoning by phosphorus and chloroform and in acute yellow atrophy, the amount of fibrinogen in the blood is reduced. When the blood of a patient with any of these diseases clots, it does so in normal time but the clot is soft, does not contract and solidify, and is of little value in the closure of severed vessels for the stoppage of hemorrhage. Reduction of fibrinogen is usually also accompanied by decrease in the prothrombin content of the blood. The damaged liver is unable to produce adequate amounts of either fibrinogen or prothrombin.

Extensive disease of the liver may, therefore, affect the coagulation of the blood by reducing the amount of fibrinogen or of prothrombin or of both. If prothrombin alone is reduced, there is not enough of this substance to precipitate all the fibrinogen available and the clot formed in such blood is soft and ineffective in stopping hemorrhage. If the fibrinogen alone is decreased the normal amount of thrombin is incapable of precipitating enough fibrin to produce a firm clot. When both of these factors are reduced the result is the same. These are the reasons why hemorrhage is a frequent accompaniment of diseases of the liver. Some indication of the extent of the deficiency can be determined by measuring the amount of fibrinogen in the blood and the prothrombin time. There is also a difference in the significance of the results in each case. Reduction in the amount of fibrinogen is evidence of extensive damage to the liver itself. A prolonged prothrombin time may be due either to damage to the liver or to interference with the absorption of vitamin K from the intestine because of the absence of bile salts from the intestinal contents. The result of administration of vitamin K and bile salts will reveal whether the prolonged prothrombin time is due to uncomplicated obstruction or to serious damage to the liver with or without obstruction.

BLOOD PROTEIN MANUFACTURE

It is probable also that the liver manufactures other proteins of the blood, particularly fibrinogen, serum albumin and globulin. These three substances differ in composition and in their relative amounts in the plasma. Fibrinogen has a molecular weight of over 200,000 and there is only 0.27 gram per 100 cc. of plasma. Because of the large size of its molecule and the very small amount present it has no appreciable influence on the osmotic pressure of the plasma proteins. The molecular weight of globulin varies between 150,000 and 190,000 and it is present in the plasma in the proportion of about 2.7 grams per 100 cc. Serum albumin has a molecular weight of between 70,000 and 75,000 and its normal concentration in the plasma is about 4.1 grams per 100 cc. The osmotic pressure of any substance in solution varies directly as the number of molecules present. It is evident that the number of molecules of albumin in plasma vastly exceeds that of fibrinogen and globulin combined and that it is chiefly responsible for the osmotic pressure of the plasma proteins. Because of the smaller size of the albumin molecule it can pass more easily through injured capillary walls. It is the first of the plasma proteins, therefore, to become depleted in certain diseases and is the chief factor in the production of edema of the type due to decrease of osmotic pressure of the plasma.

It is only rarely that in diseases of the liver the serum albumin is decreased below the critical level at which the osmotic pressure of the plasma proteins becomes sufficiently lowered to give rise to edema. However, in some cases of very chronic cirrhosis of the liver, in addition to the characteristic ascites due largely to increased venous pressure in the portal system, there is also edema which may be limited to the lower extremities or may be generalized. Such generalized edema is a result of depletion of plasma proteins.

One or more of three factors may be responsible for this edema. In the first place, the ascitic fluid is rich in serum albumin. Repeated paracentesis results in continued loss of plasma proteins. In uncomplicated cirrhosis of the liver the total amount of protein lost by one paracentesis may exceed 200 grams. The average daily loss from repeated paracentesis is 10 grams (Myers and Kiefer). In the second place, pressure of the accumulated fluid in the peritoneal cavity on the inferior vena cava and iliac veins may cause sufficient increase in venous pressure in the veins and capillaries of the

lower extremities to cause edema in these regions. However, this occurs only in massive ascites. Finally, the diseased liver is unable to manufacture plasma proteins in sufficient quantity, particularly in combination with further depletion by repeated paracentesis, to maintain them above the critical level below which edema occurs. Hypo-albuminemia and hyperglobulinemia are frequent in chronic hepatic disease, particularly in decompensated cirrhosis, with inversion of the albuminglobulin ratio. This hyperglobulinemia and inversion of the AG ratio is the basis of the Takato-Ara test for hepatic function—a test which is too non-specific to be of value. After paracentesis there is frequently a rapid diminution of serum albumin in the plasma due to the prompt recurrence of the ascites. Butt, Snell and Keys assert the changes in colloid osmotic pressure of the plasma in cirrhosis are probably due to qualitative as well as quantitative alterations in the plasma proteins. Bollman believes that ascites and edema in cirrhosis are not directly related to the protein levels or to the osmotic pressure of the plasma but more definitely to the extent of the hepatic injury.

Phosphatase of the serum is increased in all forms of liver disease whether with or without jaundice. The reason for this is not clear. The liver contains only minimal amounts of this (alkaline) phosphatase and the feces contain a considerable quantity. It is possible that the normal liver may excrete this enzyme while the damaged liver is unable to do so.

The sinusoids and veins of the liver are capable of such enormous distension that they can contain approximately two-thirds of all the blood in the body. The liver is, therefore, an important factor in regulating the total volume of circulating blood. It is probably concerned in certain types of shock. The hepatic veins in this animal contain a very heavy coat of smooth muscle in the media which serves as a sort of "hepatic sphincter" (Dale). When a shock dose of a foreign protein, to which the dog has been sensitized, is given the explosive liberation of histamine causes constriction of the muscular hepatic veins. The liver becomes enormously congested with blood which accumulates behind the blockade in the hepatic veins, the total volume of circulating blood is markedly reduced, systematic blood pressure falls precipitately and the animal quickly passes into a state of shock. A similar condition can be produced by mechanically constricting the hepatic veins. Since the blood leaves the liver and enters the inferior vena cava at a place about an inch from the heart, the liver serves as a safety reservoir or "flood chamber" in which blood can be impounded to protect the heart from being overwhelmed with blood which it is unable to keep moving in normal quantity and at the normal rate because of handicaps due to cardiac disease. This ability of the liver to impound great quantities of blood may be a life-saving mechanism in patients in the early stages of cardiac decompensation.

There are interesting similarities and differences between the temporary impounding of blood in the sinusoids of the liver and its storage in the sinusoids of the spleen. In both locations the plasma loses fluid and the suspension of cells becomes more concentrated. Red blood cells stored in the spleen are shunted out of the general circulation into myriads of microscopic cul-de-sacs as part of a permanent mechanism capable of meeting any emergency need for red blood cells, if and when (i. e., before) it arises, as after hemorrhage, by discharging its store of erythrocytes into the circulation. Blood impounded in the liver is retained in the regular channels of circulation through which its passage is impeded and the rate of flow decreased, possibly by contraction of the "hepatic sphincter." The mechanism of impounding blood in the liver comes into action after the emergency, e. g., cardiac decompensation, arises and withdraws blood from the general circulation.

Furthermore, much fluid escapes from the blood in the liver in the form of lymph, so that the blood which leaves this organ is more concentrated than that which enters it. This serves as a temporary safety device when excessive quantities of water are absorbed from the intestines or when large amounts of fluids are given rapidly by intravenous injection. Most of this water is stored in the tissues, with the necessary amount of sodium chloride to maintain its isotonicity with the tissue fluids, until it can be excreted by the kidneys. While water and salt are passing into the tissues some of it is being squeezed out of the blood into the lymphatics of the liver. But this water then passes slowly by way of the thoracic duct into the left subclavian vein to be returned to the

general circulation. Hence in dealing with an excessive intake of water, the liver plays a role in thus temporarily shunting some of the excess out of the circulating blood until it can be better stored in the tissue spaces awaiting its turn to be finally excreted through the kidneys.

SUMMARY

The liver has a larger total blood supply than any organ in the body except the lungs. It works under a lower oxygen tension than any other organ in the body. During fetal life it is the chief source of blood cells. It contains a large part of the reticuloendothelial system which is responsible for the destruction and disintegration of worn-out erythrocytes. It either stores or manufactures substances which are essential for the formation of new red blood cells. It produces three of the factors concerned in the coagulation of the blood. It probably manufactures serum albumin and globulin and maintains their osmotic pressure in the circulating blood, thus playing an important part in the exchange of fluids between the blood and the tissues. It serves as a safety reservoir or "flood chamber" and by impounding blood protects the heart in decompensation. These are only a part of the various activities of this versatile organ. Others will be discussed in a later paper.

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Cancer of Cervix and Fundus Uteri

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CANCER is a disease of many manifestations and ramifications, the primary purpose of which is to terminate the life of the host. Since cancer of the uterus is the most frequently encountered malignant tumor in women, it is important that the diagnostic points and methods of treatment be thoroughly familiar to all physicians so that an early diagnosis may be made and the patient referred promptly to the specialist for treatment.

The early recognition of carcinoma of the uterus is of paramount importance. This is a disease that is insidious in its development, often causing but little inconvenience to the patient until it is well advanced.

The cardinal symptoms of cancer of the uterus in the usual order of occurence are: discharge, hemorrhage and pain. The discharge is often only an increase in a leukorrhea of long duration. As the tumor grows and becomes more vascular, the watery sero-sanguinous discharge becomes pronounced. There is then occasional blood-tinged discharge and then bloody discharge and hemorrhage. Pain is a late symptom, occuring in cases that are moderately advanced. Therefore, every woman having an unusual amount of vaginal discharge, an increase in menstrual flow, or bleeding between periods, should receive a most careful examination. Discharge and hemorrhage, even in slight amount, after the menopause should immediately be investigated; if the cause of these symptoms is cancer, the disease is in its most hopeful stage, but many physicians do a hurried manual examination or no examination at all, and thereby fail to make a diagnosis when the disease is in its curable stage.

DIAGNOSIS

There have been numerous serological and chemical tests advocated to detect the presence of carcinoma in the human body as well as specific tests for carcinoma of the uterus, but most of them have complicating factors which make them of doubtful value or useless. The only accurate method is the removal of a specimen of suspected tissue and microscopic examination of a slide prepared from the tissue.

The examination of the female patient, in which a malignancy of the genital organs is suspected, should always be done on a gynecological table. It should include a thorough examination by palpation, both vaginal and rectal. In cases difficult to examine because of poor relaxation or pain, the author has found the use of a nembutal suppository (3 grain) inserted into the rectum 45 minutes before re-examination, of great value. The size, shape and consistency of the cervix should be recorded. The uterus should be palpated bimanually. The size, shape, consistency, position and mobility should be recorded. With a finger in the rectum, the palpation of the adnexa is

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easily accomplished. Enlargements or tenderness of the fallopian tubes and ovaries is easily determined. Early induration in the broad ligaments can be detected much easier by the rectal palpation than by the vaginal method.

A bivalve vaginal speculum should be properly inserted, and careful inspection of the vagina and cervix carried out. The large everting type of cancer is easily recognizable, and a specimen for diopsy is easily obtained by the use of a biting forcep. It is sometimes necessary to stop the bleeding from this procedure by the use of electro-coagulation. Inspection alone is not reliable when the cervix is lacerated or hypertrophied, therefore, a specimen should be removed for a biopsy from the area most suggestive of cancer. The characteristic appearance of cervical erosion is usually considered sufficient to rule out cancer, but in every such case a specimen for biopsy should be removed from the most suspicious looking area.

After the vaginal speculum has been removed, the table should be extended so that the patient can lie in a comfortable supine position. The abdomen should then be palpated with particular attention being directed to the iliac fossae and the regions along the lumbar spine so that extensions of the malignancy will not be overlooked.

When a bulky everting carcinoma is not present, the patient should have a dilatation of the cervix, and careful currettage of the cervical canal. Cervical polyps are smooth, pedunculated masses that are easily removed for biopsy. It is sometimes difficult, at times impossible, to determine whether the specimen of adeno-carcinoma obtained by curretage came from the upper end of the cervix or the fundus. Sharp uterine currettes should be used in the fundus. Since the site of predilection for adeno-carcinoma of the fundus is in the fornices, they should be carefully searched with the currette. Currettage should be done with great care for it is easy to perforate a uterus through an area of friable carcinoma. Sarcoma of the uterus is a rare condition and usually is diagnosed when the uterus is removed for suspected fibroids, or metastasis are found in the lungs, or at autopsy.

Microscopical study of the specimen removed is the only method of establishing the true nature of the pathological process. It will eliminate making an erroneous diagnosis of malignancy on lesions caused by such diseases as tuberculosis, chancroid, trichomonis vaginitis, infectious granuloma, syphilis, etc.

TREATMENT

In planning the treatment for cancer of the cervix, a method of classifying the extent of the disease from the clinical viewpoint is of great importance, since the clinical extent of involvement is the major factor in determining the prognosis. The clinical classification of cancer of the cervix by Schmitz[4] is clear and concise. It is as follows:

"*Stage I.* Beginning nodule or ulcer not larger than 1 cm. in diameter with normal mobility of uterus and adnexa."

"*Stage II.* A tumor or ulcer involving one-half or all of cervix in either the transverse or longitudinal diameter, and dough-like consistency of the para-cervical tissue. The uterus then assumes a decreased mobility due to loss of normal elasticity of the adjacent connective tissue."

"*Stage III.* (a) Tumor or crater of cervix with rigidity of adjacent tissues. (b) Involvement of the paravetrium, the vaginal lymph nodes, or both. The mass as a whole has impeded mobility."

"*Stage IV.* (a) Involvement of the parametrium, the vaginal lymph nodes, or both, with faxation. (b) Involvement of bladder, rectum, or vagina. (c) Distant metastasis."

The best therapeutic opportunity is when the patient first consults the physician. Every delay, including inadequate therapy, lessens the efficacy of skillful efficient treatment.

The surgical removal of the uterus by the radical operation of Wertheim can be considered only in those early cases of Stage I, who are in exxcellent condition for operation, to be done by a specialist who has all facilities at hand, including well-trained assistants experienced in such a procedure. The general surgeon should never attempt the surgical eradication of carcinoma of the cervix. The fact that so few cases are seen in early Stage I of the disease means that the great majority, if not all cases of carcinoma of the cervix, should be treated by radiological methods.

The proper treatment of cancer of the cervix by the use of Roentgen rays and radium requires their use by a well-trained radiologist. Every case should have an individualized treatment schedule. The use of radium by physicians not adequately trained in radium therapeutics

cannot be too strongly condemned. In most cases, the author gives the initial treatments by Roentgen therapy so that a reduction in the size of the primary lesion, together with the control of any infection present in the lesion, is thus accomplished. This makes the radium application more efficacious to the primary lesion and parametrial tissues and greatly lessens the incidence of infection following the radium implanatations. The proper control of cancer of the cervix requires from 2400 to 2800R to be delivered to the region of the adnexa in about 25 days plus an adequate radium technique, as is later described in this paper, which is to precede or follow the X-ray therapy by about 6 weeks.

This is best accomplished by using high or super voltage Roentgen rays directing treatment through two portals over the anterior pelvis and two portals over the posterior pelvis of 10x15 cm. size or larger depending on the size and condition of the patient. Two lateral portals of 10x15 cm. size may be added if additional portals are necessary, because of the size of the patient, to deliver the desired dosage to the adnexa without undue damage to the skin of the treated areas. These lateral portals are seldom necessary.

The author uses an X-ray beam generated by impressing 200 kv. across the tube with 18 ma. flowing, using 50 cm. focal skin distance, with filtration of .4 mm. tin., .25 mm. copper and 1 mm. aluminum, (1.9 hvl.) or 80 cm. focal skin distance with filtration of .5 mm. copper, 1 mm. aluminum. Treatments of 200R measured in air, are given daily through an outlined portal on the back and front of one side of the pelvis. This means each side is treated every other day until the desired dosage in the adnexa is obtained. About six weeks following the completion of this course of treatment, the patient is hospitalized and a radium technique using capsules of various size with .5 mm. platinum and 1 mm. aluminum filtration is carried out. An area of the cervical canal and fundus 6 cm. in length receives 1200 to 1800 mg. hours in 34 hours. The next day 1200 to 1800 mg. hours are given to the face of the cervix by two capsules 3 cm. in length and placed 2 cm. apart and remaining in place for 24 hours. The following day 600 to 900 mg. hours are given by each of two capsules 3 cm. in length, placed as far laterally as possible in the vaginal fornices and remaining in place for 24 hours. It is of the utmost importance that the radium capsules be correctly placed, and that the rectum and urinary bladder be carefully separated as far as possible from the radium capsules by adequate amounts of gauze packing. Following each radium application, the position of the radium capsules should be checked by radiographs.

This combined method of treatment of cancer of the cervix produces changes in the skin over the treated areas, some nausea, diarrhea, and occasionally cystitis and proctitis, all of which can usually be controlled by the intelligent use of drugs and good medical care. The patient's reaction to the treatment, while severe, is not unbearable. The results obtained by this plan of therapy are very encouraging.

In advanced cases with parametrial extensions of marked degree with complete fixation of the uterus, it is occasionally advisable to use a technique employing radium needles inserted in a circular pattern at the periphery of the cervix, parallel to the cervical canal. The platinum needles, 5 cm. in length and containing 2.4 mg. of radium, are placed about 1 cm. apart, and plunged into the periphery of the cervix in a position corresponding to the numerals on a clock face. Then radium needles of the same type are turned laterally and inserted into the parametrial tissues on each side. These are left in place for from five to seven days. The vagina is packed with gauze soaked in balsam of peru. The packing in the vagina is changed every 48 hours.

In the treatment of carcinoma of the fundus of the uterus, preliminary X-ray therapy followed in six weeks by the proper application of radium in specially designed applicators[1, 2, 3], to be followed in six weeks by surgical removal (pan hysterectomy) is the method of choice. The pre-operative radiation dosage is similar, though less intensive, than that described above in the treatment of carcinoma of the cervix, but is planned individually for each case. If the patient's condition or decision is such that surgical removal cannot be done, then the plan of radiation treatment is changed so that the patient is given as intensive a course of treatment as is possible. The best results are obtained by pre-operative radiation therapy plus surgery, but radiation therapy alone approaches these results. Both of the above methods give

results better than those obtained by surgery alone.

The most important complication of cancer of the uterus is obstruction of the ureters with hydronephrosis, renal insufficiency, uremia and finally death. Intravenous pyelography should be done on all cases before therapy is started and at three to six month intervals thereafter. Obstruction to the ureters, if found early, can usually be relieved by proper dilatation and care by a competent urologist. Bone metastasis is rarely seen since uterine malignancy tends to spread by direct extension and to regional lymph nodes. Bone metastasis is being seen more often since better control of the primary lesion and regional extensions give longer remissions of even advanced cases. It is important to remember that an examination by radiographic methods should be made of any region of the skeleton where pain is persistent.

SUMMARY

To recapitulate, cancer of the uterus is a commonly encountered malignancy. It can be satisfactorily controlled if an early diagnosis is made and prompt, adequate treatment is given. Cancer of the uterus, even in late stages, offers an excellent opportunity for palliation, with lengthening of life, relief of pain, and improvement in the general well being of the patient. It should be the ambition of every physician to aid in lowering the mortality rate from cancer, and in lessening the suffering of the patient with cancer.

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Retrobulbar Neuritis

(Diagnosis, Etiology and Treatment)

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INTRODUCTION

A REVIEW of the literature on retrobular neuritis for the past ten years discloses some seventy essays and reports with footnotes multiplying the references to several hundred. On first perusal this voluminous material seems formidable, challenging one's ability to assimilate the large mass of facts, but continued study reveals some very pertinent and constant findings which relieves the perplexity of the controversial thought expressed.

Much of this controversy centers about the endotoxic origin of the disease, some of it about the differential diagnosis, and some about the treatment.

In this presentation the essayist will attempt to evaluate the substance of the literature and present his own viewpoint based on experience gained from clinical management. It should savors somewhat of a textbook description of the disease and serve as a guide in making a diagnosis, establishing the cause, arriving at a prognosis and determining a course of treatment.

The components of this essay will be taken up in the order in which they command the attention of the clinician.

SYMPTOMATOLOGY

In the history of the symptomatology the cardinal visual complaint is lowered visual acuity, generally of recent occurrence and of either sudden or gradual onset. The patient may or may not be aware of a central scotoma or his vision may have failed so rapidly as to be completely obscured in a few hours. Bilateral occurrence is not common, but when it is present one eye is usually more affected than its fellow.

In acute cases recovery is often rapid beginning in a few days and ending with complete recovery in about a week or with more or less permanent central scotoma.

The chronic cases run a protracted and progressive course and result in more or less permanent damage to the optic nerve with its consequent in loss of vision.

Since the syndrome may be ushered in with an acute contagious diseases, fever and malaise may be present as initial symptoms.

Deep orbital pain is present in some cases, but is not a constant symptom and may vary according to the etiology or may be present merely as an indirectly related symptom such

as in sinus disease where the pain originates in the sinuses per se.

DIAGNOSIS

Having elicited pertinent historical facts regarding development of symptoms and such others as use of alcohol, nicotine, drugs, diet, and the like, the diagnosis of retrobulbar neuritis is contingent upon ophthalmoscopy and perimetry.

OPHTHALMOSCOPY

In the strictest sense the term implies that there are to be no signs of optic neuritis in the fundus, and the disc is to have a perfectly normal appearance, but in the broader viewpoint paleness of the disc and even distinct optic atrophy may be observed in late stages of chronic retrobulbar neuritis.

Benedict has pointed out a most important observation regarding the condition of the optic nerve head and emphasized its prognostic value. He states that, "one characteristic of functional blocking of the optic nerve is a waxy palor of the disc without loss of substance. The nerve head is pale, but nerve substance can be seen as a translucent material within the scleral ring obscuring the view of the lamina cribosa. Restoration of or improvement in vision can be prognosticated if the pressure causing the visual disturbance and palor is removed."

It seems to the writer that this distinction is of paramount importance and should never be overlooked.

PERIMETRY

The most characteristic observation in perimetric studies of retrobulbar neuritis is a central scotoma which can be (1) relative for white, (2) absolute for colors, or (3) absolute for white.

Less characteristic but nevertheless quite common are peripheral changes such as scotomata or general concentric contraction of the fields, and in some instances chiasmal syndromata are present. If one wishes to accept an even broader scope for the disease, one or the other optic tract can be involved in a process which is no different from that involving the optic nerve and produces field changes according to the location of the lesion. In the broad sense then, there can be pre-chiasmal, chiasmal, or post-chiasmal retrobulbar neuritis, and these diagnoses can be made with sufficient pertinent data.

ETIOLOGY

Etiological constituents in this disease are legion in the literature, giving the reader the impression that under certain conditions the optic nerve elements are very vulnerable structures, and leads one to reflect upon the possibility that many cases of so-called amblyopia may actually be arrested cases of retrobulbar neuritis This also invites speculation as to the relation of acute exanthemata to coincident strabismus and the discovery of amblyopia in these cases. Perhaps the diseases of childhood are more imminent to stragismus than has been previously conceded.

The syndrome described as retrobulbar neuritis can be produced in two principal ways, by action of pressure or the action of toxins and possibly by glandular dysfunction or avitaminosis. It, therefore, seems appropriate to present in tabulated form the known and suspected causes reported.

A. *Pressure:* (from without)
   1. Anatomical anomalies of bones such as steeple skull of congenital syphilis, vessels, etc.
   2. News growths.
   3. Ecchinococcus cyst.

B. *Pressure:* (from within)
   1. Multiple sclerosis. Swelling and infiltration of the septal network of tissue within the nerve trunks.
   2. Schilder's disease. A primary degenerative disease of more extensive order.
   3. Metastasic carcinoma.
   4. Hodgkin's disease.

C. *Exotoxic Origin:* (Uusually with their specific concommittant symptoms)
   1. Alcohol.
   2. Nicotine.
   3. Lead.
   4. Quinine.
   5. Arsenic.
   6. Thallium (depilatory).
   7. Apiol.
   8. Carbon Sulfide (used in vulcanizing rubber)).
   9. Veronal (2 cases taken with suicidal intent).
   10 Botulism.
   11. Plasmociae.

D. *Endotoxic Origin:*
   1. Acute contagious diseases.
   2. Influenza.
   3. Tuberculosis.
   4. Syphilis.

5. Intestinal toxemia.
6a. Focal infection (teeth, tonsils, kidney, pelves prostate).
6b. Sinus disease
   a. Through contiguous structures.
   b. Through lymphatics or blood stream.
7. Diabetes.
8. Pernicious anemia
9. Sympathetic ophthalmia
10. Myelitis
11. Pregnancy
12. Serous meningitis

E. *Glandular:*
1. Pituitary and gonadal deficiency (normal sellano pressure)

F. *Avitaminosis:*
1. 38 cases among Chinese
2. Pellagra diagnosed by skin lesions

G. *Hereditary Optic Atrophy* (Leber's disease)

External Pressure

It is self evident that pressure from various extraneural sources can produce varied and bizarre syndromata and could simulate retrobulbar neuritis. From a functional standpoint the end result is the same whether the degenerative process be caused by pressure, inflammation or anoxia.

Internal Pressure

Multiple sclerosis is responsible for the majority of the intraneural pressure lesions and the pleurality of all cases of retrobulbar neuritis. One striking example of this is Benedict's report from the Mayo Clinic in which he numbers 155 cases of multiple sclerosis in 255 cases of retrobulbar neuritis collected.

Exotoxic Origin

From the tabulation it is at once apparent that a large number of exogenous and endogenous causes are conceded. There is little controversy about those of exotoxic origin and it is evident that when organic as well as inorganic poisons are ingested the optic nerve can suffer as well as other organs.

Glandular Deficiency

Only one case of glandular insufficiency associated with retrobulbar neuritis was found. The sella was normal so pressure was not considered the cause.

Vitamin Deficiency

The report of C. K. Lin of 53 cases, 38 of which might have been on a basis of avitaminosis is interesting as are three cases of pellagra reported by Fine and Lachman. Pellagra was diagnosed by the skin lesions and retrobulbar neuritis was present. The latter suggest that "It does not seem improbable that the relationship existing between Vitamin B_1 deficiency and the peripheral nervous system may also exist between Vitamin B_2 deficiency and the central nervous system of which the optic nerve is a part, and that in each case alcoholism plays only an indirect role.

Endotoxic Origin

Acute contagious diseases, tuberculosis and syphilis are conceded to be important causative agents of retrobulbar neuritis of endotoxic origin, but the part played by sinus disease is keenly debated.

Sinus Disease

From an anatomic standpoint variations permit diversified relationships between the ethmoidal and sphenoidal cells and the optic nerve. It is possible that disease of the mucosa may extend directly into the adjacent nerve or toxins may diffuse through bordering blood vessels.

Meyer Wiener, for example, asserts that hyperplastic sinus disease as well as suppurative sinus disease is frequently the cause of intrabulbar as well as retrobulbar neuritis. In the hyperplastic cases he states he has seen many instances where shrinking the nose resulted in alleviation of all the symptoms.

Traquair claims that in Edinburgh he and his colleagues have come to the conclusion that rhinogenic retrobulbar neuritis is very rare and that he had never seen a case which he could attribute to infected teeth or tonsils, but admits he had seen patients recover after removal of such foci. He doubts whether toxins from these sources have the necessary neurotropic affinity.

The manner in which toxic material is absorbed from the sinuses was investigated by Mullin and Ryder, who concluded that absorption of bacteria as well as inert substances from the frontal sinuses and antrum is through the lymphatics connecting with the submaxillary and internal jugular nodes. This would seem then to help exclude these sinuses from the causation of retrobulbar neuritis.

Finally, there have been multitudes of cases of suppurative sinus disease without visual symptoms.

PATHOLOGY

That pathological lesion may occur anywhere along the course of the optic nerve, chiasm or

tracts and upon its location depend the symptoms and signs already described, and if the lesion is far back, nothing will be observed with the ophthalmoscope unless atrophic changes take place. It has been demonstrated by Friedenwald that atrophy proceeds more rapidly in the direction away from the retina than toward the retina, so disc changes may appear very long after the acute process has subsided.

In the cases of intraneural pressure such as caused by multiple sclerosis degeneration of the nerve fibres is in focal areas. The myelin sheath and supporting structure becomes swollen and compresses the nerve bundles until atrophy and sclerosis ensures.

Toxic degeneration presents a picture of cellular infiltration with round cells followed by degeneration of the axis cylinders and atrophy without schlerotic thickening. This may be axial or peripheral in type with consequent central scotoma or peripheral scotoma and contraction of the fields as the case may be.

A. Juba reported autopsy of a case of chronic alcoholic retrobulbar neuritis in a young man of 34 who also suffered from delerium tremens, polyneuritis and pulmonary tuberculosis.

Degeneration of the papillomacular bundle could be traced in this case in the optic nerve, chiasm, and tract to the external geniculate body where a dorsocentral area of atrophy was found. Fine, well-defined, symmetrically arranged fatty degeneration was also found in the optic radiations completing the picture.

TREATMENT

In the cases caused by external pressure functional improvement is dependant upon the removal of the pressure and the condition of the nerve at this time. Benedict's criterion of absence of loss of nerve substance is important in the prognosis.

Where the disease is of exotoxic origin it is self-evident that the exotoxins must be eliminated.

In the group of endotoxic origin removal of the cause may be more difficult. Antiluetic treatment and tuberculin treatment are to be used where indicated and, of course, constitutional disease should have its required attention.

Suppurative sinus disease should be treated just as it would if retrobulbar neuritis were not present. There does not seem to be any justification for extensive sinus surgery in the absence of positive pathology of the sinuses. Shrinking of the membranes and such other conservative procedures are of course in order.

The administration of Vitamin B complex is justifiable in the light of our present knowledge as it apparently speeds up the recovery from symptoms.

The keynote of all other treatment is vasodilatation which relieves the anoxia of the tissues by increasing the peripheral circulation. This can be accomplished by many means.

Foreign protein therapy such as the administration of diluted typhoid vaccine (25,000,000 organisms in 5 c.c. of salt solution) can be used for several weeks.

Concurrent malarial infection has been reported as being beneficial.

Pilocarpin sweats or fever therapy accomplishes vasodilatation.

Sodium nitrite 0.5 c.c. to 1.00 c.c. of a 10% solution is effective in acute cases where permanent damage has not been done. It is administered for 6 to 8 days.

Acetyleholine 0.1 gm. daily intramuscularly compares favorabiy with sodium nitrite.

Intravenous iodine is recommended.

The retrobulbar injection of 1/100 of a grain of atropine is efficacious.

Lumbar puncture done in 45 cases gave satisfactory results according to one author, but this writer does not advise it unless there were some specific indication.

Shrinking of the sinuses with cocain and adrenalin is followed by vasodilatation and may owe its efficacy to this fact. Operating on the nasal sinus is an auto vaccination and this has been offered as the possible explanation for the only temporary benefit achieved in some cases by this procedure.

SUMMARY

1. Acute retrobulbar neuritis is due to tissue anoxia from angiospasm followed by increased permeability of the vessels and sometimes thrombosis.

2. Almost any inorganic or organic substance which is poisonous to the tissues might be causal.

3. Likewise any acute infection can apparently produce the same affect from its endotoxins.

4. Endocrines and Vitamin B complex seem to be factors in the control of retrobulbar neuritis.

5. Analysis of the many reports and the

varying results from sinus surgery indicate that no direct result may be expected from sinus surgery, and that surgery should be performed only when there are other indications for it regardless of the presence of retrobulbar neuritis.

6. Duggan has clearly demonstrated the affect of exposure to cold and chilling as a precipitating factor.

7. The pathological physiology of the disease is similar to that of shock and histamine poisoning.

8. In the light of present knowledge one is justified in prescribing Vitamin B complex for every case of retrobulbar neuritis.

9. Vasodilatation is the keynote of all the known efficacious therapy described for retrobulbar neuritis sodium nitrite being the agent of choice because of its prolonged action, safety and ease of administration.

10. No sharp line of distinction should be drawn as to location of the lesion as the same process may occur anywhere along the pathway of the optic nerve from the globe to the primary optic centers.

11. And finally, the term acute angiospastic neuropathy suggested by Duggan seems far more appropriate than any other.

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AMERICA AT WAR

FIRST AID FOR AIR RAID CASUALTIES

First aid measures applicable to the emergencies of war are embodied in a "Handbook of First Aid" issued by the Medical Division of the Office of Civilian Defense in cooperation with the American National Red Cross for the use of enrolled civilian defense workers.

The new handbook is of pocket size and has twelve chapters titled as follows: Advice to the Civilian Defense First Aid Worker; General Considerations; Care of Wounds; Dressings and Bandages; Hemorrhage; Burns; Shock (Collapse); Fractures; Artificial Respiration; Transportation of the Injured; Chemical Warfare; Miscellaneous Conditions. It will be seen from the titles that all material not relevant to the war emergency has been omitted from consideration. The book does not replace the standard Red Cross "Textbook of First Aid", which is to be used in first aid classes.

First aid measures are described within the framework of the plan for Emergency Medical Service; that is, they are described as they will be carried out under war conditions .

Numerous illustrations clarify such procedures as tying bandages, pressure to stop hemorrhage, application of traction splints and methods of transporting the injured.

Throughout the handbook, the first aid worker is cautioned against any action that should be left to a physician or any that would handicap the physician when he arrives. One of the cardinal principles emphasized is "Remember you are a first aid worker and not a physician." For instance, the worker is taught not to apply any antiseptic to a wound, not to apply ointment or salves to a burn.

About twenty pages are devoted to discussion of fractures, with detailed descriptions of fixed traction splints for upper and lower extremities, as well as improvised splints.

The chapter on chemical warfare describes types of war gases and lists briefly under each type the characteristic effects it produces and the appropriate first aid measures. This chapter also includes instruction on care of burns caused by incendiary bombs containing phosphorus. The essential point brought out is that particles of phosphorus must be removed before the usual care for burns can be given. The wound must be immersed in hot water, which will melt the phosphorus so that it may be wiped out with a gauze pad.

If only cold water is available, the phosphorus may be picked off if the wound is held under water. Another method is to apply a solution of copper sulfate (2 to 5 percent). The coating of copper makes the phosphorus stop burning and the particles may be lifted out with tweezers.

The "Miscellaneous Conditions" include heat stroke, heat exhaustion, heat cramps, frostbite and carbon monoxide poisoning.

PHARMACISTS IN CIVILIAN DEFENSE

Pharmacies may cooperate in the civilian defense program in many ways, but they are entirely unsuitable for use as first aid stations, as has been proposed in some communities, the Office of Civilian Defense indicated in recent instructions issued to its field staff.

The large amounts of glass in every drug store would make them dangerous if a bomb ex-

plosion occurred in the neighborhood and the limitations of space would make handling of casualties in them impossible, it has been pointed out.

The Emergency Medical Service program which has been worked out with great care by the Medical Division of OCD provides for casualty stations and first aid posts near the scene of a disaster, manned by physicians, nurses and medically trained auxiliaries. It is important, therefore, "that no Civilian Defense designation be given pharmacies which would tend to confuse the public concerning the location of Casualty Stations and First Aid Posts of the Emergency Medical Service," the instructional letter says.

On the other hand, pharmacies may help distribute official bulletins and phamphlets issued by the state or local defense councils. Other ways in which the pharmacist may help were listed by OCD as follows:

1. Register with the Chief of Emergency Medical Service in his community, indicating the supplies he has available.

2. If he has a delivery truck available for emergency transport, register it with the transport office of the local Defense Corps.

3. Register his pharmacy with his air raid warden, indicating the telephone and other facilities he has available.

4. Place his services at the disposal of the local Defense Council for displaying placards and distributing hand bills and other information authorized by the State and local Civilian Defense Council.

5. Inform himself of the organization, location and character of protection facilities in his neighborhood so that he can direct citizens to shelters, wardens' posts and casualty stations.

6. Review and extend his own training in first aid and prepare himself to instruct others in his employ by qualifying as a Red Cross Instructor.

7. Large pharmacies should establish among their employees a Volunteer Red Cross First Aid Detachment which can be immediately available to serve as Medical Auxiliaries to assist in the transportation of casualties.

TEXTBOOK ON WAR GASES

"Protection Against Gas," a textbook on war gases to be used for instruction of public employees and volunteers enrolled in the various groups of the United States Citizens' Defense Corps, has been issued by the U. S. Office of Civilian Defense. The book was prepared by the War Department under the direction of the Chief of Chemical Warfare Service, U. S. Army, with suggestions of the National Technological Civil Protection Committee, a special advisory committee of engineers.

The 75 page manual contains descriptions of the principal gases, their effects and the first aid measures to be used in the care of persons who have been subjected to gas attack. Methods of individual protection, which include the use of masks and wearing of protective clothing, and methods of collective protection such as use of gasproof shelters and methods of decontamination are described. There is a chapter on protection of animals.

DECONTAMINATION OF EYES AFTER EXPOSURE TO LEWISITE AND MUSTARD

Since publication of the Office of Civilian Defense handbooks, "First Aid in the Prevention and Treatment of Chemical Casualties" and "Protection Against Gas," further experience has shown that the 2% solution of hydrogen peroxide recommended for the treatment of eyes following Lewisite burns may be injurious if used undiluted. The Chemical Warfare Service now recommends a single instillation in the eyes of a 0.5% solution of hydrogen peroxide as soon as possible after contamination with Lewisite. This solution may be prepared by diluting one part of a 2% solution with three parts of water, or one part of a 3% solution with five parts of water. The solution usually found in drug stores is then S. P. strength of 2.5 to 3.5 per cent hydrogen peroxide. A 0.5% solution of potassium permanganate has also been found effective as an eye instillation following exposure to Lewisite.

In planning decontamination stations, the Medical Division, Office of Civilian Defense, recommends that provision be made near the entrance of the second or shower room for the irrigation of the eyes of contaminated persons. The schematic sketch of a decontamination station in the Office of Civilian Defense publications mentioned above shows the irrigation of eyes in the dressing room, whereas this should be carried out in the second or shower room be-

fore the bath is given. Delay until the casualty reaches the dressing room will result in more serious injury to eyes which have been contaminated with mustard or Lewisite.

PREMEDICAL AND MEDICAL STUDENTS

Appointments as Ensigns in United States Naval Reserve

The secretary of the Navy recently approved a change in Navy regulations whereby it is now possible for those premedical students who have been accepted for entrance to, and all medical students in, Class "A" medical colleges, to be appointed in the United States Naval Reserve in Class H-V(P)). provided they meet the physical and other requirements for such appointment.

Students who are acceptable will be given provisional commissions as Ensigns, and it is the policy of the Bureau of Medicine and Surgery not to nominate such officers for active duty until after they have completed their prescribed medical studies and shall have served one year's satisfactory internship in a civilian hospital accredited for interne training, or shall have been accepted as Acting Assistant Surgeon in the Navy for interne training.

Upon graduation, and when the bureau has been informed of this fact by the Dean, commissions as Lieutenant (junior grade) MC-V(G), USNR, will be issued to provisional Ensigns and, after serving their internship in non naval hospitals, they will be nominated for active duty. Application for, or acceptance of, either a provisional or permanent commission in the Naval Reserve, does not preclude the possibility of applying for a commission in the Medical Corps of the regular Navy. Persons affiliated with the Naval Reserve are not subject to induction into Army service by action of local Selective Service Boards.

Navy regulations require that all applications for appointments in the Naval Reserve be filed with the Commandant of the Naval District in which the applicant resides. The address of the Commandant of your district may be obtained from the Dean of your college.

Application forms may be obtained from the Dean's office or from someone designated by him, upon request from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., or from the Commandant of your Naval District. When your application form has been properly completed, it, together with the other credentials indicated on the application form, should be mailed to the Commandant of your Naval District. He will instruct you relative to obtaining a physical examination, finger prints, etc.

In the case of a premedical student, it is necessary to enclose with your application for appointment a statement, signed by the Dean of a medical college, to the effect you have been accepted as a first year medical student in a Class "A" school for the next entering class.

It is the understanding of the Bureau of Medicine and Surgery that Selective Service Boards will accept a statement from the Commandant of your Naval District to the effect that your application is on file, as basis for deferment until your application has received final action.

SOLDIERS AND SAILORS ON LEAVE WHO BECOME ILL

The members of the United States Navy on leave who become ill are eligible for medical care in a Navy sick-bay or under the care of a Navy medical officer. If these facilities are not available, a sailor on leave may seek service in a private hospital or through a private physician with reimbursement from the Navy.

The policy in the Army is not the same. A soldier on leave who is away from his post less than 12 hours and becomes ill may apply to an Army hospital or a private hospital or a private physician for treatment at the expense of the Army. The Army will not, however, pay for hospital or professional services for a soldier on leave who applies for such services beyond 12 hours after leaving his post. A soldier on leave may receive care from an Army hospital or an Army physician at any time.

CAMPAIGN FOR DIPHTHERIA AND SMALLPOX IMMUNIZATION

The Office of Civilian Defense, at the request of the Children's Bureau of the U. S. Department of Labor, is cooperating with the Conference of State and Provincial Health Authorities of North America and the Children's Bureau in promoting a campaign for the immunization of children against diphtheria and smallpox. In a memorandum to Regional Officers, the Director of the Office of Civilian Defense directed

Regional Medical Officers and Assistant Regional Directors in charge of Volunteer Participation to urge state and local medical defense officials to support the health officers in their communities in this activity as a measure for wartime protection of the civil population.

SOCIETY ACTIVITIES

WARNER W. WATKINS, M. D.
Secretary
Arizona State Medical Association

L. B. COHENOUR, M. D.
Secretary
New Mexico Medical Society

LOUIS BRECK, M. D.
Secretary
Southwestern Medical Association

CHAS. F. RENNICK, M. D.
Secretary
El Paso County (Texas) Medical Society

EL PASO COUNTY (TEXAS) MEDICAL SOCIETY

(W. John Pangman, Associate Editor)

The regular meeting of the El Paso County Medical Society, presided over by Dr. Barrett, President, was held March 23, 1942 in the Tea Room of the Hotel Cortez.

A very interesting presentation was made by Capt. M. W. Boynton entitled: "Endocrines in Gynecology." Almost everyone who participated in these discussions said that this was, without doubt, the best presentation of the subject that he had ever heard. Capt. Boynton clarified and brought up to date the endocrines used in gynecology with a full discussion at the end of Stilbestrol. Those that participated in the discussion are: Dr. Hart, Dr. Snidow, Dr. Hardy, Col. Gallagher, Dr. Dutton, Dr. Curtis, Dr. Breck, Dr. Gorman and Dr. Causey.

Dr. Bob Homan brought to the attention of the meeting that only a few doctors had registered with the Civilian Defense. If you expect to do any moving around during a black-out it is absolutely necessary to be registered.

Mr. E. B. Powell of Ortho Products, makers of Ortho Gynol, presented a moving picture with sound entitled: "The Prevention of Fertility."

Meeting adjourned.

Chas. F. Rennick, Secretary.

El Paso County Medical Society met on April 13, 1942, for this program:

Cholecystic Disease—Round Table Discussion.
(Discussion opened by Dr. James J. Gorman)

At the regular Staff Meeting of the Hotel-Dieu Sister's Hospital, Tuesday, April 7, 1942, the program was:

Pneumococcic meningitis .....Dr. Bennett
Discussion .....Dr. Duncan
Symptomless Bronchiogenic Carcinoma, complicating accidental injury...Dr. Stevens
Discussion.....Dr. Duncan, Dr. Waite

The regular meeting of the City-County Hospital Staff, Wednesday, April 15, 1942, at 6:30 p. m., was devoted to the following program:

Coccidioidal Granulomas, and case of Ichthyosis, by Dr. Leslie M. Smith.

The regular meeting of the El Paso County Medical Society, presided over by Dr. Barrett, President, was held March 9, 1942 in the Tea Room of the Hotel Cortez.

A paper was given by Capt. Wm. H. Frackelton entitled "Purposeful Splinting of the Hand." Discussion by Drs. Louis Breck, Leighton Green, Capt. McIntyre, Dr. E. B. Rogers, Lt. Smith, E. J. Cummins, and Col. Paul Gallagher.

A letter from the Central Council Social Agencies with regard to the appointment of a new health director was read by the secretary. An explanation of the letter was made by Dr. Hart who had been present at the meeting of the Health Division Council when the subject was discussed. There was considerable discussion lead by Drs. Gallagher, McCamant, Green and Morgan. This discussion brought up the idea that possibly the Central Council of Social Agencies wanted the appointment of Dr. Johnson of the Public Health Service to the office of Health Director of the local Unit. A motion was made by Dr. Cummins and seconded by Dr.

Laws to the effect that the secretary should answer the letter stating to the Council that the El Paso County Medical Society wishes to cooperate with the Board of Health and endorses the requirements and standards of the State Health Department, but up to the present time no names of candidates have been presented to this Society by the City Council or Commissioners Court for endorsement.

Meeting adjourned.

Chas. F. Rennick, Secretary.

SOUTHWESTERN MEDICAL ASSOCIATION

(Louis W. Breck, M. D., Associate Editor)

A most interesting and important bit of news in connection with the Southwestern Medical Association is the matter of the meeting next fall. There is considerable difference of opinion among members of the executive committee, as to whether or not a meeting should be held. Final action on the subject has not been taken and the concensus of opinion seems to be that a meeting should be held in November as usual, but that guest speakers be dispensed with and that "local talent" be used from within the organization. This would cut down the expense of the meeting by about $1000, which would make it financially possible to hold a meeting even with a smaller attendance. Amongst the members of the Association at large there are many who think that the Association should suspend its activities for the duration of the present war, but the majority seem to be in favor of having a meeting. Those members of the association who care to voice their opinion may do so by writing the secretary and are certainly welcome to do so. As voted on at the last meeting, Albuquerque has been chosen as the meeting place for this year.

It is worthwhile to mention periodically that Southwestern Medicine is glad to receive for publication papers written by members of the Southwestern Medical Association. Contributions from doctors belonging to the Southwestern Medical Association have been excellent recently, and it is hoped that the good work will keep up.

Besides the many doctors who have been called to the Army and Navy, who live in the bigger cities in the Southwest, a great many have been called for rural communities so that our roster has been appreciably diminished. We are certainly all proud of our men who have gone to the service and want to offer them our heartiest best wishes. The associate editor of Southwestern Medicine from the Southwestern Medical Association would greatly appreciate it if members of the association and readers of this Journal would drop him a line concerning items of interest about members of the Association. There is no definite new gathering agency for the Association and we depend on hearing from the members themselves. Items concerning members in or out of the service will be very much welcome.

Louis W. Breck, M. D., Secretary.

NEW MEXICO MEDICAL SOCIETY

(L. B. Cohenour, Associate Editor)

The Secretary has the following communication, dated April 17, 1942, from Dr. John D. Clark, president of The Basic Science Board:

Dr. L. B. Cohenour
First National Bank Building
Albuquerque, New Mexico.

Dear Dr. Cohenour:

The Basic Science Board has been issuing certificates of registration to those who were licensed to practice a healing art in New Mexico before July 18, 1941, but it hasn't, as yet, issued certificates to many doctors of medicine.

In my judgment, word probably has not reached many doctors that these certificates are available to them if they send 25c (stamps will do) to our secretary at Santa Fe. We had to charge the 25c because it costs this for postage to send the certificates around the circuit for signatures.

It occurred to me that this might be a suitable item for publication in *Southwestern Medicine.*

A great many doctors have been spoken to, and without exception all of them feel that if they secure this certificate of registration, the same being registered in Santa Fe, that in the future it will be impossible ever to raise the question of their compliance with the Basic Science Law.

Sincerely yours,

JOHN D. CLARK, President,
Basic Science Board.

Correspondence should be addressed to Pia Maria Joerger, Office of Secretary of State, Santa Fe.

The regular meeting of the McKinley County Medical Society was held on Wednesday evening, March 25, 1942, at St. Mary's Hospital, Gallup, New Mexico. A group of about twenty were present, including members of the local medical society, several doctors from the Indian Service Hospitals and representatives of the State Health Department, Santa Fe, New Mexico.

Due to the special program, the regular business meeting was dispensed with. Dr. Stewart W. Adler, State Director of Maternal and Child Health, spoke regarding the immunization of children, of pre-school age, as advised by the President of the United States, to forestall an epidemic during war time.

It was proposed to begin a "Summer Roundup" of medical examinations in this community with the cooperation of the local health department and members of the Parent-Teachers' Association.

A committee was appointed, from the local medical society, to meet with Dr. E. B. Beaver, Health Officer for McKinley and San Juan Counties, to discuss the best means of procedure, and later a special meeting of the other members of the Society will be called to definitely organize this program.

Two colored films, with sound attachment, were shown in connection with Public Health work. First, a film titled, "Another to Conquer," in reference to the control of Tuberculosis on the Indian Reservations; and second, "When Bobby goes to School," illustrating the importance of pre-school examinations. The latter picture is to be shown to the general public as approved by members of McKinley County Medical Society.

Dr. E. F. McIntyre, State Director of Venereal Disease Control, then directed the presentation of three reels of technicolor films on "Syphilis, its Diagnosis and Management," and another film, also on this subject, titled, "Know for Sure," as sponsored by the New Mexico Public Health Department.

A vote of thanks was given to Drs. Adler and McIntyre for the splendid program presented.

Drs. D. F. Monaco and W. D. Anthony of Gallup left by plane from Albuquerque to attend the four-day session of the Dallas Southern Clinical Conference in Dallas Texas, and also postgraduate lectures at Baylor University.

W. D. Anthony, M. D., Secretary.

COMMUNICATIONS

Sir:

I am enclosing a brief notice which I hope is suitable for the May issue in the *Southwestern Medicine*. The program appears in more detail in the May, 1942 issue of "Diseases of the Chest", copy of which is enclosed. Would you be kind enough to return this to me to be reentered in my journal? There are enough outstanding men on this program so it should be quite a valuable one to those interested in chest diseases, and I know quite a number of men in the Southwest are.

Thanking you for your courtesy, I am

Very truly yours,

CHARLES S. KIBLER, M. D.

(The notice follows.—Ed.)

CHEST PHYSICIANS MEET

For physicians interested in pulmonary diseases, there is an opportunity to attend a worth while meeting while attending the annual American Medical Convention. The American College of Chest Physicians has arranged their meeting to be held at Hotel Dennis, June 6-8, at Atlantic City. Speakers on the regular scientific program include Dr. Joseph Peabody, Washington, D. C., Dr. Ralph Matson, Seattle, Dr. Louis Clerf and Dr. C. J. Bucher, Philadelphia, Dr. Paul Holinger, Chicago, Dr. Richard Overholt, Boston, Dr. Herman Kretschmer, Chicago, Dr. O. Auerbach, New York, Dr. William Peterson, Chicago, Dr. Frank W. Burge, Philadelphia, Dr. Chevalier Jackson, Philadelphia, and Dr. Hans Schiffbauer, Los Angeles. This meeting includes a joint session with the American Broncho-Esophagological Association. Further details of this meeting appear in the May, 1942 issue of "Diseases of the Chest."

Sir:

Would you kindly publish the following information in the next issue of your magazine:

"The Western Branch of the American Urological Association will hold its annual convention this year at Hotel Del Monte, California, from June 22 to June 24."

Very sincerely yours,

MILES GRIFFIN,

Publicity Committee.

AUXILIARY NEWS

MARICOPA COUNTY

Two social events have been given by the Maricopa County Medical Auxiliary.

The first was a potluck luncheon on Wednesday, May 6, in the home of Dr. and Mrs. George Irvine, Tempe, Arizona. Officers for the year 1942 and 1943 were elected. They are: President, Mrs. James R. Moore; First Vice-President, Mrs. Paul Case; Second Vice-President, Mrs. Louis Jekel; Secretary and Treasurer, Mrs. R. W. Hussong.

Mrs. Harlan P. Mills, President-Elect, of the Women's Auxiliary to the Arizona Medical Association, gave a brief talk and suggestions for the Auxiliary activity for the coming year.

The closing social event of the year was the usual picnic at the Hide-Out in South Mount Park Saturday night, May 9.

We urge all of the members to work this summer in the Surgical Dressing Department. We have made 27,000 dressings in the last three months in our Auxiliary Room in the Grunow Clinic, and it will be open during the summer every Tuesday and Friday from 10 a. m. to 3 p. m.

Mrs. Thomas A. Hartgraves,
County Publicity Chairman.

LAST CALL for reservations for the Twentieth Annual Convention of the Woman's Auxiliary to the American Medical Association, which will be held at Haddon Hall, Atlantic City, New Jersey, June 8-12, 1942. Atlantic City extends a hearty welcome to you.

SUMMER DIARRHEA IN BABIES

Casec (calcium caseinate), which is almost wholly a combination of protein and calcium, offers a quickly effective method of treating all types of diarrhea, both in bottle-fed and breast-fed infants. For the former, the carbohydrate is temporarily omitted from the 24-hour formula and replaced with 8 level tablespoons of Casec. Within a day or two the diarrhea will usually be arrested, and carbohydrate in the form of Dextri-Maltose may safely be added to the formula and the Casec gradually eliminated. Three to six teaspoonfuls of a thin paste of Casec and water, given before each nursing, is well indicated for loose stools in breast-fed babies. Please send for samples to Mead Johnson & Company, Evansville, Indiana.

MISCELLANY

CLASSIFICATION OF ANEMIAS

1. Decreased production anemias.

A. Decreased hemoglobin synthesis (characterized by small red cells) due to deficiency of:

1. Iron, copper and manganese—chlorosis, idiopathic hypochromic, chronic blood loss (iron loss).
2. Protein—nutritional.
3. Thyroid—hypothyroid anemia.
4. Vitamin C—anemia of scurvy.

B. Decreased maturation of early nucleated red cell forms at megaloblast level (characterized by large red cells due to:

1. Deficient intake of extrinsic factor—pellagra, beri-beri, tropical anemia of pregnancy.
2. Deficient production of intrinsic factor (gastric mucosa)—pernicious anemia, carcinoma of stomach, gastric operations.
3. Deficient absorption or storage—sprue, intestinal parasites, idiopathic steatorrhea, cirrhosis of liver.

C. Aplastic group—due to maturation arrest of all the cells (usually normal sized cells) caused by:

1. Chemical agents—arsenic and benzene intoxication.
2. Physical agents—radium poisoning.
3. Idiopathic.
4. Chronic infections.

D. Miscellaneous causes—due to actual encroachment of the bone marrow by:

1. Abnormal cells — leukemias, malignancies, Hodgkin's disease.
2. Abnormal storage by normal cells—lipoid histiocytosis (Neiman-Pick's disease, Gaucher's disease, Hand-Schuller-Christian syndrome).
3. Replacement by bone and fibrous tissue—osteosclerosis.

2. Increased destruction anemias.

A. Increased destruction associated with hemolysin in plasma or abnormal cell structure:

1. "Familial" hemolytic anemia—usually associated with increased fragility and sphericity of red cells.
2. Sickle cell anemia.

B. Increased destruction due to infection:

1. Malaria.
2. Gas bacillus infection *(B. Welchi)*.
3. Hemolytic streptococcus infection.
4. Oroyo fever.

C. Increased destruction due to chemical and biological agents:

1. Sulfanilamide and related compounds.
2. Snake venoms.
3. Acute lead poisoning.
4. Incompatible blood sera.
5. Favism (allergic).

D. Acute and subacute blood loss.

Some minor deviations from the classifications above may be noted. For instance, the anemia of scurvy may show little or no change in cell dimensions. In macrocytic anemias due to deficiency of the extrinsic factor, there is a relatively smaller increase in the size of red blood cells. The anemia of cirrhosis of the liver is peculiar in that the red cells are relatively thinner than normal.—*Tri-State M. J.*

BUTTER

Most recent research has revealed a new factor in butter, as yet unnamed. The substance has never been isolated, and although work is now going ahead rapidly on it, all that is yet known is that young animals grow much better when supplied with it than when fed only vitamins A and D and supplementary fats of a non-dairy origin.

The digestibility of butter is uniformly good. All fats with a low melting point are easy to digest, and butter is in this class of fats, ranking second only to fish liver oils in ease of digestion and completeness of utilization. Besides, butter on digestion yields fatty acids of low molecular weight, which play an important role in the process of metabolism.

About two ounces of good butter daily will supply the vitamin A requirements of an average child, and two to three ounces of butter with a pint of whole milk daily will be quite adequate for an adult's vitamin A requirements. Butter is not to be depended upon alone for an adequate supply of vitamin D, although its value as an accessory source of vitamin D is very important. Just what amount of the newly discovered "butterfat growth factor" is required for normal growth, and to what degree butter is adequate in supplying it, have not been established. However, research indicates that butter may prove adequate to supply man's requirements of this substance.

The importance of the nutritional value of butter was not always as fully recognized as it is today. Scientists had known for years that fats are needed for human growth, but until the early part of this century, when E. V. McCollum made his first studies at the University of Wisconsin, little else was known, and no attempt had been made to determine which fats are needed and why.—*Wisc. Med. J.*

DILANTIN SODIUM IN ASTHMA

Because of recent work on the psychogenic aspect of bronchial asthma and the concept of the so-called "asthmatic personality," a search was made for a drug that would have a psychosomatic effect on children with bronchial asthma. Recent work with Dilantin Sodium and its application in the treatment of epilepsy have amply proved this to be a powerful and efficient anticonvulsant. The infrequency of toxic effects, in addition to its reported effect of improvement in the epileptic personality, marked the drug as one worthy of trial in cases of bronchial asthma.

Seven cases of intractable, severe bronchial asthma were selected for treatment with Dilantin Sodium. These cases were skin tested and were found to be sensitive to many different allergens. The ages of the patients ranged from three to fourteen years. The sex factor was not controlled, although in this series there were 4 boys and 3 girls. The patients received Dilantin Sodium for periods varying from five months to one year, although several were studied for a far greater length of time.

The dosage of Dilantin Sodium was determined for each patient by "self-titration" methods. When adequate dosage was maintained, 6 patients remained consistently free from attacks of bronchial asthma. Two patients reported abortive attacks, consisting of slight wheezing, which passed off rapidly. In only 1 case did toxic symptoms result from the ingestion of the drug. In this case, the toxic symptoms cleared rapidly on withdrawal of the drug, and the patient was able to resume treatment with a slightly smaller dose.

In 2 cases complicated by seasonal allergies, nasal and ocular symptoms of the allergy occurred and could not be controlled with Dilantin Sodium.

During the administration of the drug, there were no change in environment and no dietary restriction. During this period, some of the patients suffered acute upper respiratory infections, with no resulting bronchial asthma, in sharp contrast with the previous history of these patients. To test the efficacy of Dilantin Sodium in controlling asthmatic attacks brought on by emotional upsets, many patients were encouraged to enter situations and environments that formerly precipitated attacks of bronchial asthma. With this drug as the sole medication, the patients were consistently free of attacks of bronchial asthma, and they were able to engage normally in athletic and social activities. In the 1 case in this series in which complete success was not obtained, the lack of parental co-operation and understanding was an important factor.—*N. E. J. of Med.*

TINTED LENSES

The use of tinted glasses has increased to such an extent lately that one might be led to believe most people fear their eyes need protection even against good daylight, hence the too general use of sun glasses. Advertisers of variously colored glasses have made every conceivable claim for their products. One can understand how the layman may be led to believe in the miraculous benefits claimed for the use of such glasses, but even ophthalmologists are being duped.

Tinted lenses are essentially protective glasses. Except in certain abnormal conditions in which it is necessary to protect the eyes from ordinary light, they are useful only in the presence of glare—direct or reflected light which is so excessive or misdirected that it is painful or harmful to the eyes. Ordinary sunlight, unless reflected directly into the eyes, is not harmful to healthy, properly corrected eyes. So-called sun glasses should be made to serve one purpose and that is to reduce the amount of direct or reflected light on those occasions when the intensity is so great that it is painful or interferes with vision. They are not to be used constantly out of doors. To serve the purpose of sun glasses they must be dark enough to absorb about 75 per cent of the light. The lightly tinted ones are no better than ordinary clear glass. No tinted glass should be worn indoors, certainly never at night. They are dangerous for night driving. The glare of an automobile headlight is due to the contrast with the surrounding darkness and dark glasses cannot change that; they will dim the headlight, but they also make the surroundings darker. The sense of eye fatigue after day driving is more often due to uncorrected or improperly corrected errors of refraction than to the bright light. It is certain that sun glasses cannot be used as substitutes for corrective lenses in the case of a refractive error.—*J. M. S. M. S.*

PHYSICIANS' ALOOFNESS IN THE NATIONAL THOUGHT OF TODAY

And the doctors? What have we been doing to strengthen democratic thought? What part are we playing in public affairs? What sacrifices are we making for the betterment of our political institutions that this land become a better place for all men, high and low, to live in? What sacrifices are we making, as did our early Doctor-Politician-Statesmen and our early fighting Doctor-Parsons?

Individually we are practicing scientific medicine, making our daily call; serving, *when invited,* on a hospital or health board committee. But, and this is more important, we have failed to assume responsibility for public policies that are fundamentally medical; we have failed to discuss systematic plans in our county and state medical society meetings for the care of the indigent sick; although we do all the work for them without any compensation in our hospitals, both semi-private and charitable.

And what has our national medical organization been doing? Since we have the largest medical organization in the world—the American Medical Association—composed of 125,000 American doctors, it should be the leader in all policies pertaining to the health of our people. And I am of the opinion that under its leadership machinery should be devised to make the benefits of scientific advances in medicine available to all those whose financial circumstances do not permit of adequate medical services, as well as to the well-to-do.

Instead what has happened? After being adjudged guilty of "violation of the law in restraint of trade" in a Federal Court, the American Medical Association announces: "We are not a political body. We have nothing to do with politics," and this without the assent of the

House of Delegates of the A. M. A. Think of the effect of such a do-nothing policy on the American reading public after the A. M. A.'s court record!

Why this evasion of our manifest responsibility? Because (a) the attention of the medical profession as a whole has been directed to the scientific aspects of disease and to the application of this knowledge to the particular patients whom we are treating. For the county and state medical societies are organized almost entirely for scientific purposes. And because (b) participation in political thought by any doctor has been discouraged and his activities have actually been suppressed by the press of Organized Medicine. If he dares to question that the medical care of the indigent can be improved, he is silenced by the statement that—"American medicine is the best in the world," or "a doctor should have nothing to do with politics." They confused politics with partizanship.

The result of this abandonment of public affairs by educated men—including physicians—is illustrated by what happened in Austria.—*J. Med. Soc. N. J.*

INTRA-BONE MARROW INFUSION

A new route for the administration of fluids, namely, by way of the bone marrow, has become available through the recent work of Tocantins and O'Neill (Surg., Gynec. and Obst. 73:281, Sept. 1941). For the detailed account of the procedure the original article must be consulted, but a general description of the method is as follows:

A special needle, fitted with an inner needle and a stylet is inserted into the marrow cavity of a bone. The manubrium, or the body of the sternum, is best suited except in the case of small infants. In the latter, one of the long bones, preferably the humerus, tibia or femur should be selected. After entering the marrow cavity, a small amount of blood-marrow mixture (0.1 cc.) is withdrawn. Sterile saline solution should then be alternately injected and aspirated until all the air is displaced by the fluid. The inner needle is then removed and the outer needle connected by means of an adapter and rubber tubing to the buret containing the infusion fluid. The solution is allowed to flow in by gravity, and the rate may vary from 0.4 to 25 cc. per minute.

Bone marrow infusion is essentially the same as the intravenous injection since the absorption into the general circulation is exceedingly rapid and direct. It is therefore the methtod of choice when veins are difficult to find or to enter. The relative immobility of the needle inserted into a bone has the advantage that fluids can be given to restless patients or in emergency conditions such as in an ambulance, in which the maintenance of a needle in a vein would not be feasible or perhaps possible.

It is obvious that no irritating or hypertonic solution should be given via the bone marrow. At the present stage of development, it seems best to limit the list of fluids to be administered by this route to citrated blood, citrated plasma, serum, 5 per cent glucose, and physiological salt solution. It is logical to conclude that blood given by the intramedulary route is of greater and more prompt benefit than when injected intraperitoneally, especially since absorption is greatly depressed in certain disorders of the gastrointestinal tract. Parenthetically it might be stated that the value of blood injected intramuscularly is of doubtful value under any circumstance. Large amounts of saline (as much as 2,000 cc.) have been given successfully in shock when general vascular collapse made intravenous administration exceedingly difficult.

There appear few contraindications for marrow infusion. It should not be used in generalized infection accompanied by bacteremia, since a suppurating process may localize at the site of the injection in the marrow cavity.

In Tocantins' hands the method has been highly successful. In forty patients on whom marrow infusion was carried out, no local or systemic reactions were noted. The author at the outset was aware of the danger of fat emboli from the marrow fat, but points out that the untoward complication is very remote. In none of his patients was there evidence that any significant amount of marrow substance got into the blood stream. The injection of fluid into the marrow causes no demonstrable local damage, and the patient suffers discomfort either during or after the infusion.

The method of marrow infusion is still too new to be fully evaluated, but its potential usefulness should be recognized. Whenever intravenous medication is indicated, but difficulties arise in utilizing this route of administration, the new method via the bone marrow

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should be considered. It is to be emphasized that the method is not intended to replace intravenous administration, but is a welcome alternative procedure when conditions make the latter difficult or well nigh impossible.—*Wisc. Med. Jo.*

BOOK NOTES

L. O. DUTTON, M. D.
(Book Review Editor)
Mills Bldg., El Paso, Texas

NEUROANATOMY, by Fred A. Mettler, A.M., M.D., Ph.D. Professor of Anatomy, University of Georgia School of Medicine, Augusta, Georgia. With 337 Illustrations, including 30 in color. The C. V. Mosby Co., St. Louis, Mo. 1942. $7.50.

This textbook for medical students consists of two main parts. Part one covers the gross aspects of the neural system and covers 179 pages. Part two covers the microscopic anatomy of the neural system and takes up the remainder of the 385 pages of text. The discussion of the gross anatomy lays a firm groundwork for the remaining consideration of the microscopical features. The text is well adapted for students in that all new terms are carefully defined as they are encountered, and the sometimes confusing terminology of neuroanatomy is kept clarified by the use of alternate terms in parenthesis following the term of the author's choice.

The style is clear and concise and the book is profusely illustrated with excellent drawings and charts. Not the least valuable feature of the book, for advanced students, is the 53 pages at the end of the volume devoted to a list of selected references. These, in the main, are from the American literature, although outstanding articles from the foreign literature are also included. The reviewer's impression is definitely that of a sound readable text.—*L. O. Dutton.*

THE TOXEMIAS OF PREGNANCY, by William J. Dieckmann, M. D., Associate Professor of Obstetrics and Gynecology, The University of Chicago; Attending Obstetrician, The Chicago Lying-in Hospital and Dispensary; Attending Gynecologist, Albert Merritt Billings Memorial Hospital of the University of Chicago; Associate Editor of the American Journal of Obstetrics and Gynecology; Co-chairman of the Conference on Eclampsia, United States Department of Labor, Children's Bureau, 1941. With 50 text illustrations and 3 color plates. The C. V. Mosby Co., St. Louis, Mo. Price $7.50.

This extremely well documented volume is an important contribution well worth perusal by all interested in this field, not only those whose practical interest lies in the management of the pregnant woman, but also those students of physiology whose interest carries them into the pathological aspects of this subject. The author states that he wishes to acquaint the obstetri-

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cian with some of the recent contributions on physiology pertaining to obstetrics and to acquaint the investigator untrained in obstetrics with some of the physiology and pathology of obstetrics. He has ably achieved these aims.

The volume is divided into sections dealing with the classification, incidence and pathology of the toxemias of pregnancy—the normal and abnormal physiology, the etiology of eclampsia, the clinical aspects of the toxemias of pregnancy, the treatment of the toxemias of pregnancy, the maternal and fetal prognosis and prenatal care. Each section presents not only the views of the author, but well-summarized opinions from other important investigators in the field. Each section is followed by a full bibliography so that this volume could well serve as a nucleus for an extensive study in this field.

In the realm of pathological physiology great attention is paid to pathology of eclampsia, the application of physiochemical determinations, the study of eclampsia, the place of the vascular system in eclampsia, and the physiology and pathology of the kidneys and liver. There is a carefully presented section on pharmacodynamics of the important drugs used in the treatment of eclampsia, and the practical steps in the management of these patients are precisely outlined with sufficient background so that the use of these measures can be intelligently supervised.

The make-up and type of this volume are pleasing and it can be highly recommended. There are 521 pages.—*L. O. Dutton.*

A MANUAL OF PHARMACOLOGY, by Torald Sollmann, M.D., Professor of Pharmacology and Materia Medica in the School of Medicine of Western Reserve University, Cleveland. W. B. Saunders Co. 1942. PPrice $8.75.

This sixth edition of Sollmann's well-known manual should be a valuable addition to the library of any thoughtful practitioner. Although designated as a sixth edition, the volume has been practically re-written, bringing up to date the many recent significant advances in this field. The arrangement of the text is concise and helpful, in that basic discussion of each subject is presented in ordinary type, while sections of smaller type, often quite voluminous, discuss the more detailed features which one would consult only for some special purpose. No effort has been made to describe all preparations of

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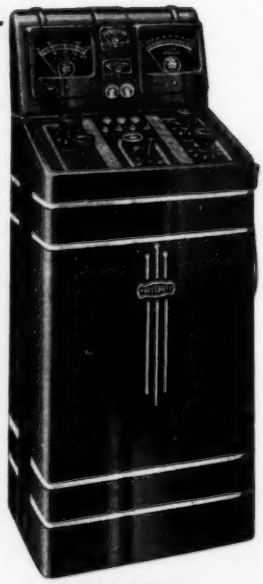

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TEXTBOOK OF SURGERY (Third Edition), by American authors. Edited by Frederick Christopher, B.S., M.D., F.A.C.S., Professor of Surgery, Northwestern University Medical School, chief surgeon Evanston (Illinois) Hospital. 1764 pages with 1538 illustrations on 771 figures. W. B. Saunders Company, Philadelphia. Price $10.

All that was written by this writer in praise of the second edition can be said of Christopher's Third Edition. Its list of contributors reads like a roll call of the great and near-great in American Surgery. It encloses in one volume the essential facts on most surgical subjects. The book has been revised and brought up to date. A new section on (1) gastric ulcer appears, also a new treatise on (2) anal pruritus and hemorrhoids. Other new sections are those covering (3) abnormalities of the thymus, (4) compound fractures (5) coccidoidal granuloma, and (6) treatment of patent ducts arteriosus. A timely chapter on (7) war injuries has been added.

In discussion of surgical procedures, attention is given to other techniques than the one preferred by the author, thus giving a more comprehensive view of the subject. For instance, under treatment of hernia, both transplantation and non-transplantation of the cord are described.

Most outstanding recent advances in surgery have been in treatment with sulfonamide drugs. Various authors have included in the revised edition discussion of use of chemotherapy and results to be expected. While primarily intended for students, this book is highly recommended as a valuable reference work for every surgeon's library.—*J. Leighton Green.*

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METHODS OF TREATMENT IN POST-ENCEPHALITIC PARKINSONISM, by Henry D. von Witzleben. Grune and Stratton, New York, 1942; pp. 164; $2.75.

One hundred and sixty-four printed pages, devoted exclusively to one disease entity, have provided the author with ample scope for complete discussion. An introduction by Dr. Theodore J. C. von Storch relates something of the author's background and experience, to provide the basis for an authoritative work.

The opening chapter is devoted to precise definition of the disease entity under discussion, and to differential diagnosis. Post-encephalitic Parkinsonism is described as "not a sequela or a meta-disease of acute epidemic encephalitis", but as "a form of chronic epidemic encephalitis typified by very characteristic signs", which "must be differentiated from all other forms of Parkinsonism, particularly from paralysis agitans, which is the original Parkinson's disease." Differentiating signs, symptoms, and methods are given detailed consideration.

The next eleven chapters are concerned with treatment: general remarks, chemotherapy, serum and vaccine treatment, itralumbar methods,

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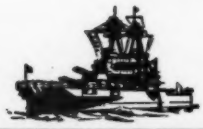

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surgery, fever therapy, Roentgen ray therapy, general medicaments, alkaloids, and treatment by physical exercises and calisthenics. It appears that the author has little confidence in any of these methods except one specific aspect of alkaloid treatment—now known as the Bulgarian treatment—aided and abetted by controlled exercises. The new technic for application of the Bulgarian treatment (consisting essentially of the administration of "a total extract from the roots of Atropa belladonna") is described with meticulous detail, but without prejudice. The author's own methods and results are emphasized, but other methods are not neglected.

The author says that "no single compilation of the literature on therapy has yet been made. It has therefore been necessary to resort, painstakingly, to the original articles, in order to evaluate the various therapies recommended for the disease." The bibliography includes twenty-four pages of references. Altogether, this book should prove of value to any one interested in the symptomatology, diagnosis, and treatment of post-encephalitic Parkinsonism.—*R. L. Larsen.*

THE PSYCHOLOGY OF DEALING WITH PEOPLE—Serving the Need of a Feeling of Personal Worth, by Wendell White, Ph.D., University of Minnesota: Author of the Psychology of Making Life Interesting. New edition, completely revised and reset; New York, The MacMillan Company, 1941. $2.50.

The title of the book portrays nicely the contents of the book; the contents are thoroughly practical for most persons if not for all. Who is there of us who does not need to improve his dealing with his fellows?

Of course, one reading or even a memorizing of the entire text can not make some of us into the diplomats we'd like to be, but a careful study of it might do a lot.

There are 267 pages divided into four parts and 20 chapters; each paragraph or several paragraphs has a subheading which makes for impressive reading and easy learning. The type is excellent.

Every physician can profit from reading this and he can safely recommend it to his patients.

O. H. Brown.

MAN—THE MECHANICAL MISFIT, by G. H. Estabrooks: The MacMillan Company, New York, 1941. $2.50.

This is a highly thought-provoking book. It should have a general reading.

The author's thesis is that nature has been

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striving throughout the ages to develop a type of animal which may most successfully inhabit the earth. There were the scorpions, the dinosaurs and the thunder beasts. They came, stayed a time, perhaps hundreds of years and then because they were misfits they went. They are now extinct.

Nature is now experimenting with man. Fighting man are bacteria, viruses and other disease producing elements. The medical profession—friendly enemies, he calls us—is preventing the diseases from eliminating the weaklings. The better stock among the humans is practicing birth-control; the feeble-minded and less-intellectuals generally are over-populating the earth. Wars take only the most fit. We persist in having wars. The number of insane and incompetents are definitely on the increase. Hence in time—hundreds of thousands of years perhaps—the highest type of human as we know him today is certain to be eliminated and nature has to begin her experiments over again.

What is to follow the human race of today he does not predict.

The book is most readable. It is entertaining with a world of facts about evolution, civilization and medical history which will interest practically everyone. One who starts the reading of it will find it difficult to lay down until finished.—*O. H. Brown.*

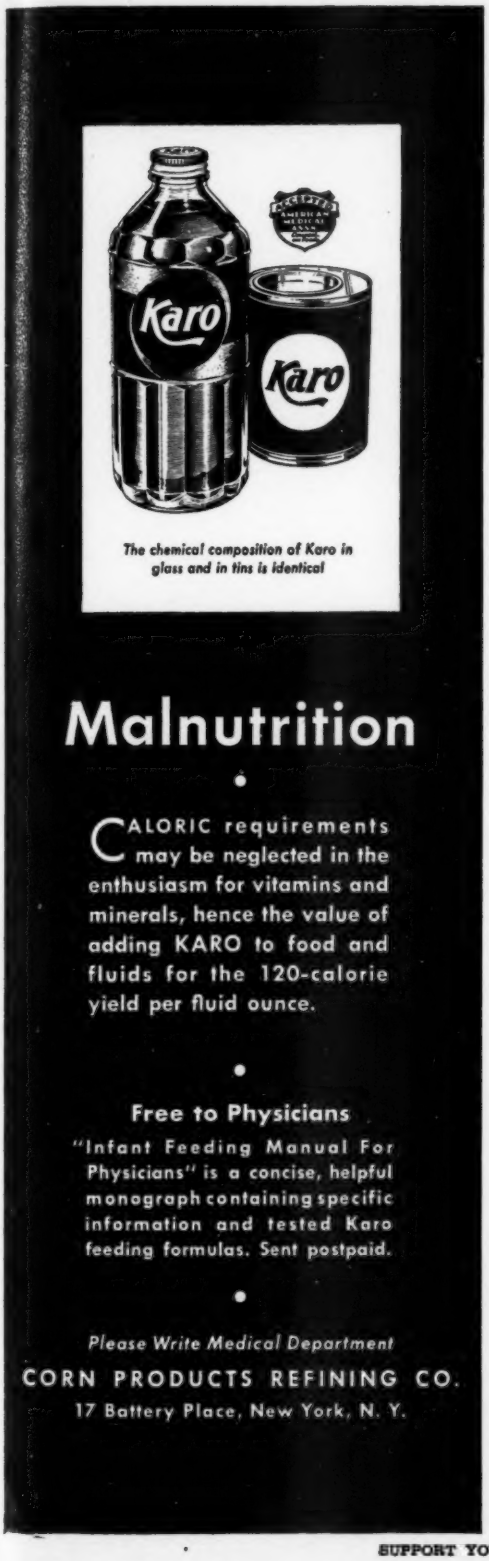
VICE-PRRESIDENT OF THE UPJOHN FIRM DIES

Malcolm Galbraith, vice-president and director of sales of the Upjohn Company, died Friday morning, April 10, in Kansas City.

Mr. Galbraith was born in Bowmanville, Ontario, Canada, October 23, 1876. He received his bachelor of pharmacy degree at Ontario College of Pharmacy in 1898, entering in the drug business in Ontario the same year. He later became a naturalized citizen of the United States. In 1909 he left the H. K. Mulford Company of Philadelphia to join the Upjohn Company. In October, 1929, he was elected to the board of directors and named director of sales. He was made vice-president of the company in May, 1936.

VITAMIN FILMS IN COLOR

Eli Lilly and Company, Indianapolis, announces the release of three 16-mm. silent motion pictures in color descriptive of vitamin deficiency diseases. The films are available to physicians for showing before medical societies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and hospital staffs. One deals with thiamine chloride deficiency one with nicotine acid deficiency, and the third with ariboflavinosis. The major part of all films concerns the clinical picture presented by the patient with reference to treatment by diet and specific medication. They do not contain advertising of any description, nor is the name of Eli Lilly and Company mentioned.

The films were made at the Nutrition Clinic of the University of Cincinnati at the Hillman Hospital, Birmingham, Alabama, where studies were initiated in 1935, under the joint auspices of the Department of Internal Medicine of the University of Cincinnati and the University Hospitals of Cleveland. Subsequently, these investigations became a cooperative project between the Departments of Medicine of the University of Cincinnati and the University of Alabama, and the Department of Preventive Medicine and Public Health of the University of Texas.

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